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# Understanding and Applying Design Thinking

Courtney Zwart

*International Center for Studies in Creativity*, courtneyzward@yahoo.com

## **Advisor**

Dr. Cyndi Burnett

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Understanding and Applying Design Thinking

A Project

by

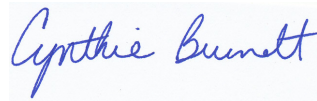
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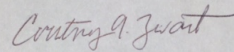
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Candidate

## Abstract

*Understanding and Applying Design Thinking*

The intent of this project was to gain an in-depth understanding of design thinking, both by internalizing its principles and fundamentals and applying them to an actual design challenge. I began with an extensive review of the literature and also interviewed an experienced design thinking practitioner. I then completed an 8-week online course in design thinking offered by the University of Virginia, which provided instruction in a 15-step approach to design thinking as well as key tools to use in the approach. Finally, I applied this approach to a design challenge owned by a leading consultancy in New York City. I detailed key learnings I had from both applying the process as well as comparing the approach to the Thinking Skills Model of Creative Problem Solving (Puccio, Murdock, & Mance, 2007). I concluded with both professional and personal actions that I plan to take as a result of learnings from this project.

*Keywords: Design Thinking, Creative Problem Solving.*

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## Understanding and Applying Design Thinking

### **Section One: Project Background**

#### **Project Purpose**

This project is designed to provide me with an in-depth understanding of design thinking, as well as the experience of applying the approach to an actual design challenge. While the applied component of the project will provide value to a third party, the primary purpose is to assist me in developing a new skill.

#### **Project Description**

This Master's project will consist of both learning design thinking and doing design thinking. In the learning phase, I will acquire and summarize key knowledge as it is related to design thinking. This knowledge will include the underlying principles of design thinking, how it operates and supporting mindsets. It will also include a review of the strengths and weaknesses of the approach and contexts in which it best operates. Finally, it will include a comprehensive comparison of design thinking to the Thinking Skills Model of Creative Problem Solving (Puccio, Murdock, & Mance, 2007).

In the applied component, the doing phase, I will use the design thinking approach on a key challenge owned by a third party. All four stages of the design thinking process will be applied to the challenge: exploration of the current state, envisioning of a new future state, converging on compelling options and refining the lead option based on user feedback.

The primary creativity concept involved in this project is that of process. Design thinking provides those solving problems, or addressing opportunities, with a systematic process to identify a novel solution.

### **Rationale for Selection**

My professional experience with creative problem solving is in the context of new product development. Specifically, I have worked with researchers and creativity practitioners to identify consumer insights and translate them into concepts for new products. The Thinking Skills Model of Creative Problem Solving has provided me with a powerful framework for tackling problems and addressing opportunities (Puccio, Murdock, & Mance, 2007). I now seek proficiency with a methodology that provides a more systematic approach to assessing the current state, especially as it relates to user needs, as this is a critical input for ultimate concept development. Design thinking delivers this and also includes a valuable element, prototyping, to which I'd like exposure. Finally, given the rise in the profile of design thinking in the business arena, proficiency in this methodology is a competency I believe is required in a creativity practitioner in 2014 and beyond.

## **Section Two: Pertinent Literature and Other Resources**

### **Pertinent Literature**

This section details the books, articles, videos and interviews that both informed and inspired my journey into design thinking. Materials reviewed are listed from the most comprehensive on the topic of design thinking to those are more narrowly focused on its specific elements.

Martin, R. L. (2009). *The design of business: Why design thinking is the next competitive advantage*. Cambridge, MA: Harvard Business Press.

In his book, Roger Martin, former dean of the Rotman School of Management at the University of Toronto, explored what design thinking is, how it operates and how individuals can apply it in organizations, as well as how they can grow their capacity for design thinking via

expanding their personal knowledge system.

Martin opened the book with the knowledge funnel, a concept that is foundational to his overall approach and which he described as “a model for how businesses of all sorts can advance knowledge and capture value” (p. 4). It involves identifying a marketing opportunity (referred to as a mystery), determining and creating an offering for that market (referred to as a heuristic, an imperfect and incomplete sense of what might solve the mystery) and making its operations systematic (referred to as translating the operations into an algorithm).

He described design thinking as the dynamic, and balanced, interplay between analytic prowess and intuitive originality. And, he proposed that design thinking allows organizations to move along the knowledge funnel. He further defined design thinking as “thinking like a designer would” (p. 62) and wrote that “a person or organization instilled with that discipline is constantly seeking a fruitful balance between reliability and validity, between art and science, between intuition and analytics, and between exploration and exploitation” (p. 62). He indicated that true design thinking organizations apply the designer’s tool of abductive reasoning to challenges. Quite distinct from the very logical (and defensible) inductive and deductive reasoning, abductive reasoning does not strive to prove something that is true or false, rather “its goal is to posit what could possibly be true” (p. 65). Those using this type of reasoning actively seek new data, challenge existing assumptions and explanations and consistently look ahead to infer new possibilities.

Martin proposed that all individuals have a personal knowledge system, defining it as “a way of thinking about how we acquire knowledge and experience” (p. 152). This system has three components, which must be expanded in order to improve one’s design thinking ability. The first component is stance, “the knowledge domain in which you define how you see the

world around you and how you see yourself in that world” (p. 153). Is the world one that embraces new ideas or one that is hostile to them? The second component is the tools individuals use to organize their thinking and make sense of the world around them. These tools range from rigid analytical framework to “loose rules of thumb” (p. 154). They help individuals tackle problems and are directed by their stance. The final component is experiences. These “form your most practical and tangible knowledge” (p. 155) and are “the product of your stance and tools, which steer you toward some experiences and away from others” (p. 155).

Brown, T., & Katz, B. (2009). *Change by design: How design thinking transforms organizations and inspires innovation*. New York, NY: Harper Business.

In this book, Tim Brown, the author (and CEO and President of IDEO) laid out a roadmap for integrating design thinking across organizations, products and services. He began with his definition of design thinking, “a way of describing a set of principles that can be applied by diverse people to a wide range of problems” (p. 7). And, he argued that design thinking should not only be applied to the creation of new physical products, but that it also excels as an approach to create new processes, services, interactions, forms of entertainment and ways of better working together.

The roadmap he offered for design thinking is a system of overlapping spaces versus a series of linear steps. These spaces are inspiration (“the problem or opportunity that motivates the search for solutions” (p. 16)), ideation (“the process of generating, developing and testing ideas” (p. 16)) and implementation (“the path that leads from the project room to the market” (p. 16)). He indicated that the design thinking approach is necessarily non-linear and iterative, one adjusts and refines the approach as one’s understanding of the problem evolves. He also discussed the crucial role of constraints in order for the overall design effort to be successful.

These constraints include feasibility (what is possible in near future), viability (what makes business sense) and desirability (extent to which people want it). Constraints are considered throughout the process, but a premium is placed on fundamental human needs.

As it relates to understanding human needs, Brown identified three key elements related to creating a successful design program. These are insight, observation and empathy. Insight is gained by viewing a problem from different perspectives and challenging assumptions about it. Observation involves watching what people do instead of what they say (as much of what they do, they may not do so consciously). Empathy is “the effort to see the world through the eyes of others, understand the world through their experiences and feel the world through their emotions” (p. 50).

Brown also touched on other ingredients for success, including diverse teams and a supportive environment. Regarding environment, he indicated that a social and spatial environment “in which people can experiment, take risks and explore the full range of their capacities” (p. 32) is critical. He indicated that a key component of that culture is optimism, specifically, that “people have to believe that it is within their power (or at least the power of the team) to create new ideas that will serve unmet needs and that will have a positive impact” (p. 76).

He emphasized the role of prototyping throughout the process, stressing that, early on, prototypes should be low fidelity and made with minimal resources. This is critical as the “greater the investment in an idea, the more committed one becomes to it” (p. 90). He stressed that the role of prototyping is to provide enough form to an idea such that one can identify its strengths and weakness, which will identify new possibilities for the next generation of the prototype. He advised that different forms of prototyping include drawings, storyboards, videos

and even acting out. Towards the end of the process, prototypes become necessarily more sophisticated and refined, as these prototypes will be screened with actual users and customers.

Liedtka, J., & Ogilvie, T. (2011). *Designing for growth: A design thinking tool kit for managers*. New York, NY: Columbia Business School Publishing.

In this book, Liedtka and Ogilvie provided a robust, and in-depth overview of design thinking. The topics covered include mind-set, criteria for choosing design thinking and design thinking process and tools. And, throughout the book, the instruction is brought to life with real examples of the application of design thinking at start-ups, mid-size companies and global corporations.

Good designers are optimistic that a solution exists for any challenge (or opportunity). At the outset of projects, they don't directly seek a solution, rather, they seek to understand the problem space and evolve their learning as they work towards a solution. Good design thinkers experiment, they do not get attached to early concepts or prototypes as these items are simply tools along the journey to create the ideal solution.

Not every problem or challenge is appropriate for design thinking. The following criteria should be applied to determine whether or not to use this approach for a challenge or opportunity:

- *Problem/challenge is human-centered* – A deep understanding of the actual people (users) involved is possible and important (note that key to the approach is conducting an actual experiment in a real environment with people).
- *Problem/challenge is not fully understood* – Defining the problem is as important as coming up with the solution. Stakeholders involved likely can't agree on a definition of the problem, much less on a solution. A hunch about it exists, but further exploration

and agreement is needed.

- *High level of uncertainty* – There are many unknowns (large and small) and past data is unlikely to assist, either because there isn't any or because it's not clear whether or how it's relevant.
- *High degree of complexity* – there are many connecting and interdependent facets of the problem; it's hard to know where to start.

The process the authors presented is a four-stage, 15-step approach. The stages are “What is”, “What if”, “What wows?” and “What works?” In the “What is” stage, the current reality is explored and the problem or opportunity is framed. Steps here include executing research (primary and secondary), identifying insights from research and establishing design criteria around themes that emerge from the insights. In the “What if” stage, new possibilities for growth are generated. Steps in this stage include brainstorming ideas and developing concepts. In the “What wows?” stage, assumptions are tested and prototypes are created and refined. Steps in this stage include surfacing key assumptions and making prototypes. In the “What works?” stage, users are enrolled and the solution is shaped into something that can be executed. Steps here include obtaining feedback from stakeholders, executing learning launches and designing the on-ramp (how the solution will be offered to users).

To complete these steps, the authors offered a variety of tools for each step. Tools for the research step include secondary research, direct observation, ethnographic interviews, job to be done, value chain analysis, journey mapping, personas, 360 empathy and creating posters. Tools for the generating ideas step include brainstorming. Tools for developing concepts include anchors, bring-build-buy map, forced connections and combinatorial play. Tools for the prototyping step include visualization basics, storytelling and storyboarding. Finally, tools for

getting feedback from customers include co-creation tools.

Brown, T. (2008). Thinking. *Harvard Business Review*, 86(6), 86-92.

In this article, Brown laid out the fundamentals of design thinking and details how it can transform the way products, services and processes and strategies are developed. He described design thinking as a “discipline that uses the designer’s sensibility and methods to match people’s needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity” (p. 86). And, he detailed five key characteristics of effective design thinkers: empathy (imagining the world from multiple perspectives), integrative thinking (moving beyond analytic thinking), optimism (assuming that challenging problems have at least one alternate solution), experimentalism (tweaking innovations and exploring constraints in creative ways) and collaboration (ability to work in interdisciplinary teams but also having experience in more than one discipline yourself).

Distilling the elements of the discipline, Brown characterized design thinking as “a creative human-centered discovery process that is followed by iterative cycles of prototyping testing and refinement” (p. 88). He described these cycles as a system of spaces – inspiration, ideation and iteration -- versus a sequential series of steps and acknowledges that, for this reason, design thinking may feel “chaotic for those experiencing it for the first time” (p. 88). Inspiration refers to the problem or opportunity motivating the search for a solution. Ideation refers to the process of creating, developing and testing ideas. Implementation refers to creating a path to market for the solution. He noted that design projects pass through all three spaces and often loop back over the course of the project.

Regarding prototyping, specifically, Brown advised that this key component to the design thinking approach should be applied to services, not just products. He acknowledged that while



prototypes of service innovation will not be physical, it's important that they be made tangible via pictures or video as these "help us understand what is learned through prototyping" (p. 87).

He also advised that prototyping should not be elaborate or expensive – time and effort should be spent only to create something that will generate meaningful feedback and advance the idea. The more finished the prototype, the less its creator will learn. In sum, the value prototyping of is in uncovering the strengths and weaknesses of an idea and discover areas to which further prototypes might lead.

Burnett, B. (2013, May 13). *Design thinking: Training yourself to be more creative* [video].

Retrieved from <https://www.youtube.com/watch?v=34EuT2KH2Lw>

In his 2013 video, Professor Burnett, Executive Director of the Design Program at Stanford, laid out the origins and fundamentals of design thinking, including what it "stands for." He advised that design thinking started at Stanford when, in 1963, the board of trustees approved the establishment of a joint degree in art and engineering. Burnett noted that a well-known graduate of the program is David Kelley, founder of both the company that became IDEO and the Hasso Plattner Institute of Design at Stanford, known as the d.school.

Burnett described design thinking as both a process and a mindset, in sum, a way of approaching problem solving. While schemas exist that lay out the phases of design thinking, Burnett cautioned to "not get too hung up on the process diagram" as design thinking doesn't always proceed in a linear fashion. He advised the approach begins with empathy versus market research, the latter the chosen tactic of more traditional processes. Tools used in the empathy stage of the process include ethnography and anthropology. It is the empathy phase that "unlocks" innovation most, as, Burnett stated, "most of the time people are working on the wrong problem" and learnings gained through this stage help us to reframe the problem and

identify the optimal one to solve. Design thinking prioritizes problem finding so that actual problem solving efforts can be most effective.

Finally, Burnett indicated that design thinking stands for three primary things. It stands for “a dynamic approach to problem solving” in that it heavily relies on prototyping (and iteration) throughout the process. It also stands for “an approach to problem finding” with its focus on re-framing problems, reliance on empathy and ethnography. Finally, it stands for “a new perspective on value creation”, given that it is “a human-centered, co-creation process that prioritizes user needs and yields the highest value to all stake holders”.

Dorst, K. (2011). The core of ‘design thinking’ and its application. *Design Studies*, 32(6), 521-532.

This article explored how organizations might use the design process to address new, open and complex problems. It focused on the framing and frame creation activities of the process, as these activities are unique to a design-centered approach and not part of conventional problem solving processes. Framing creation begins with the designer identifying the central paradox of the problem. Designers do this by “asking themselves what it is that makes the problem so hard to solve” (p. 527). Work on a solution begins only when they have satisfactorily established the nature of the core paradox. They then explore issues around the core paradox – at the outset, they do not attempt to directly solve the core paradox itself. They seek information and insights around the broader problem environment and distill this content into themes. These themes then become triggers to create new frames that enable designers to address the central paradox in a novel way.

An example of frame creation was provided to illustrate these activities. A major city was experiencing drunkenness, fights, theft and drug dealing in its entertainment district of bars and

clubs. The local government's response had been to increase police presence and hidden cameras, neither of which was effective in addressing the problem. Designers engaged to solve the problem determined that officials were using the wrong frame – “law and order problems needing law and order solutions” (p. 529) – and engaged in research and clue finding to identify a new one. They identified a few key themes: those involved were young, non-criminals who wanted to have fun and got bored and frustrated over the course of their night out. The paradox was that they were not having a good experience on their night out. The designers reframed the issue by studying the themes that emerged and sourced an analogy with which to work – that of a large music festival. Thinking of the entertainment district as a large music festival enabled them to generate compelling ideas such as providing later transportation from the area (historically, the last train departed the area at 1:20 AM) and a smart phone app to tell those in clubs how long the line was at the club next door (so, if it was too long, they would stay in the initial club and not wander the streets).

Owen, C. (2005, October). *Design thinking. What it is. Why it is different. Where it has new value*. Speech presented at the International Conference on Design Research and Education for the Future, Gwang-ju City, Korea.

In his 2005 speech, Charles Owen, a professor at the Illinois Institute of Technology, discussed the nature of design thinking, explored how it differs from other modes of thinking and offered characteristics of effective designers. Ultimately, Owen argued for the application of design thinking to decision-making at the highest levels of policy to address problems sourced by a population growth and stress on resources and the environment. He distinguished between two different types of creative people, finders and makers. The former demonstrate their creativity through discovery and the latter through exercise their creativity through invention. That latter

are most effective as design thinkers. He also provided a framework for evaluating different fields of work by content and process, with symbolic/real on the y-axis and analytic/synthetic on the x-axis. What's important in the framework is the relative position of fields. While design is positioned at the bottom right (synthetic/real), science occupies at the top left (analytic/symbolic) – making it easy to see how these two differ and how they complement on another. He also articulated that the values of fields are different. Science is driven by understanding, correctness, thoroughness and testability. Design is driven by the need for form, cultural fit, appropriateness and utility.

On the topic of characteristics of creative thinking, he offered Fabun's list, of sensitivity, questioning attitude, broad education, asymmetrical thinking, personal courage, sustained curiosity, time control, dedication and willingness to work. He augmented this list with psychiatrist Silvano Arieti's findings of fluency of thinking, flexibility, originality, redefinition, elaboration and tolerance for ambiguity. He concluded this discussion of characteristics with inclusion of Csikszentmihalyi's perspective that creative people embody the following pairs of opposing traits: generalized libidinal energy and restraint, convergent and divergent thinking, playfulness and discipline (or irresponsibility and responsibility), fantasy and reality, extroversion vs. introversion, humility and pride, masculinity and femininity, traditional conservatism and rebellious iconoclasm, passion and objectivity and suffering and enjoyment.

Finally, he offered the following characteristics and ways of working as important for design thinking: creativity, conditioned inventiveness, human-centered focus, environment-centered concern, ability to visualize, tempered optimism, bias for adaptivity, predisposition toward multifunctionality, systemic vision, view of the generalist, ability to use language as a tool, affinity for teamwork, facility for avoiding the necessity of choice, self-governing

practicality and ability to work systematically with qualitative information.

Leavy, B. (2010). Design thinking: A new mental model of value innovation. *Strategy & Leadership*, 38(3), 5-14.

In this article, Leavy, Professor of Strategic Management at Dublin City University Business School, explored the central argument of Roger Martin's book, *The Design of Business: Why Design Thinking is the Next Competitive Advantage* and offered additional perspectives on the broader topic of innovation that supported that argument. He described the development of an innovation hierarchy, as articulated in Gary Hamel's book, *The Future Of Management*, and indicated that innovation at higher levels of that hierarchy – strategy innovation and management innovation -- leads to greater value creation and will take competitors years to imitate. And, he indicated that design thinking has much to offer when applied to these higher levels.

The author also presented three different modes of reasoning and described that which is most associated with effective design thinking. The first two modes, deductive and inductive reasoning, he asserted “both use existing or historical data to draw conclusions as a guide to future action” (p. 9) and are closely associated with analytical thinking. He indicated that the third type of reasoning, abductive reasoning, explores “what might be” (p. 9) and is best suited for design thinking. This type of reasoning can only be validated with the creation of new data with prototyping and testing. The belief here is that novel ideas are created when the creator observed data that was different than that of existing frameworks or paradigms.

Clark, K., & Smith, R. (2008). Unleashing the power of design thinking. *Design Management Review*, 19(3), 8-15.

In this article, Clark and Smith, a marketing director and a designer from IBM, argued for the application of design thinking to achieve strategic business initiatives that are driven by the

need for innovation. Characterizing design methods as orderly, inclusive and innovative, they advised that design thinking can “help business leaders make their intentions real – by clearly defining goals, deeply understanding customers, and getting their internal teams aligned to deliver results” (p. 9).

They acknowledged that it’s not easy to describe design thinking to executives and propose that it is associated with innovation intelligence. Specifically, that design thinking is “driven by intelligence that embraces innovation and gives your organization the freedom to explore multiple ways to solve problems and discover the option that best delivers competitive advantage” (p. 9). Additional types of intelligences support design thinking and developing fluency in these can make one a more effective design thinker. These intelligences are emotional intelligence, integral intelligence (ability to connect user needs and business capabilities to deliver value) and experiential intelligence (being able to understand and activate all five sense to bring innovation life).

Brown, T., & Wyatt, J. (2010). Design thinking for social innovation. *Stanford Social Innovation Review*, 8(1), 30-35.

In this article, Brown and Wyatt provided a broad overview of design thinking and loosely connect it to social innovation. They described design thinking as “inherently optimistic, constructive and experiential” (p. 29) and underscored that it incorporates consumer and stakeholder insights in depth and relies heavily on rapid prototyping to iterate to a final solution. Design thinking focuses on creating products and services that are human centered, but the authors stress that the process itself is also very human. Specifically, the process relies on its users’ ability to be intuitive and recognize patterns, to create ideas that have emotional meaning but that are also viable.

They defined design thinking not as a sequential process, but as overlapping spaces, the three spaces being inspiration, ideation and implementation. Inspiration is the challenge or problem to be solved. In this space, observation, fieldwork and ethnography are key. Ideation is the space where possibilities are generated. In this space, insights are synthesized and distilled, constraints are identified (in the form of a brief) and a team of diverse (and multidisciplinary) individuals brainstorm possibilities. Visual representations of ideas are important. Ideas are also tested in the space. In implementation, action plans are developed for leading ideas. Critical to this space is prototyping, where actual representations of ideas are iterated and refined. Once the final product or service has been created, the design team helps develop a multimedia communication plan to express the solution to a wide group of stakeholders.

T. Christensen, personal communication, September 25, 2014.

Tamara Christensen is a partner and founder at Idea Farm, an innovation consulting firm that focuses on facilitating strategic co-creation with users. In addition to being a practitioner of design thinking, she also holds a BFA in Industrial Design and an MSD and ABD in Design Methodologies and Pedagogy. I spoke with her recently on key dimensions of design thinking.

*In what situations does design thinking work best?*

With challenges and opportunities that involve people. It is most relevant as an approach when people are willing to engage diverse stakeholders and explore with them – we start out asking, “who’s involved?” We use it when the systems at play are people-focused and it’s critical to understand how to be user-centered.

*What are the benefits of applying a design thinking approach?*

It is people powered. When things don’t work, and you can’t solve problems, it’s because you don’t think about those impacted. You can’t just solve a problem and sell the solution; it’s

critical to co-create with the users of that solution. And, essentially, at the heart of most problems are people. Design thinking understands that people are the opportunity for better understanding a situation so that it can be resolved – how stakeholders experience a situation informs the solution.

*What are some of the challenges associated with applying design thinking?*

The organization or business not understanding what a paradigm shift it is. Design thinking is solution-oriented versus problem-oriented and problem-oriented is what most organizations are familiar with. In problem-oriented approaches, the focus is on the problem and its parameters. In design thinking, the focus is on hypothesizing and scenario testing. I don't know what the problem is until I conjecture a solution and see what I get. It's a moving target. Organizations are fearful of this culture shift.

*What are the qualities, including supporting mindset, of a successful design thinker?*

- Feeling and emotion. Designers are deeply emotional and super sensitive. The capacity for deep feeling, for caring and for the desire to empathize with those around you is critical. It's important to embrace the messiness of human emotion and understand that people have complex inner lives.
- The ability to go out, understand the human experience and find problems. Lots of problems. Good design thinkers generate multiple potential opportunities – all catalyzed by empathy.
- Bias for experimentation. Good design thinkers consistently ask, "If we tried this, what might happen?" They create prototypes of possible futures and test them as a way to navigate ambiguity.



**Other Resources**

In addition to the literature described above, the following sources helped to inform my greater understanding of design thinking:

Berger, W. (2010). *CAD monkeys, dinosaur babies, and T-shaped people: Inside the world of design thinking and how it can spark creativity and innovation*. New York, NY: Penguin Books.

Curedale, R. (2013). *Design thinking: Pocket guide*. Los Angeles, CA: Design Community College.

Esslinger, H. (2009). *A fine line: How design strategies are shaping the future of business*. New York, NY: John Wiley & Sons.

Kelley, T. (2007). *The art of innovation: Lessons in creativity from IDEO, America's leading design firm*. New York, NY: Random House.

Liedtka, J., Ogilvie, T., & Brozenske, R. (2014). *The designing for growth field book: A step-by-step project guide*. New York, NY: Columbia Business School Publishing.

Lockwood, T. (2009). *Design thinking: Integrating innovation, customer experience, and brand value*. New York, NY: Allworth Press.

Norman, D. A. (2005). *Emotional design: Why we love (or hate) everyday things*. New York, NY: Basic Books.

Patnaik, D., & Mortensen, P. (2009). *Wired to care: How companies prosper when they create widespread empathy*. Upper Saddle River, NJ: FT Press.

Razzouk, R., & Shute, V. (2012). What is design thinking and why is it important? *Review of Educational Research*, 82(4), 330-348.

Verganti, R. (2009). *Design-driven innovation: Changing the rules of competition by radically*

*innovating what things mean*. Boston, MA: Harvard Business Press.

Williams, R. (2008). *The non-designer's design book*. Berkeley, CA: Peachpit Press.

### **Section Three: Plan and Timeline**

#### **Process Plan**

My process plan involved the following steps:

1. Create a concept paper providing an overview for the project, rationale for its selection, plan for completing the project and personal learning goals. The plan includes a timeline, who will be involved and when and where the project will take place. The concept paper also identifies pertinent literature and resources, project outcomes and measurement of effectiveness of the achievement
2. Conduct a comprehensive review of key academic literature and non-academic publications, including those in popular press, related to design thinking.
3. Interview a design thinking practitioner on the approach. This will be important to glean insights on the methodology in operation, especially around benefits and challenges of the approach.
4. Complete a formal, instructional course on design thinking. The online course, "Design Thinking for Innovative Problem Solving: A Step-by-Step Project Course" will run from September 15 to November 10 ("Executive education," n.d.). The course will provide in-depth instruction on the design thinking problem solving process, including key steps and stages, appropriate criteria for design challenges, evaluation tools and techniques, how to incorporate prototyping, screening for profitability and planning for implementation. Material will be delivered, and learning obtained, through a combination of viewing recorded video instruction, text readings and case studies, fieldwork, assignments and interaction with

peers.

5. Apply the design thinking approach to a third party's design challenge. The design challenge that will serve as the focus for the applied component of this project is owned by a leading consultancy in New York City. The primary owner, or client, is the consultancy's chief financial officer.
6. Summarizing learnings from research and application in a formal presentation. This summary will include learnings regarding the underlying principles of design thinking, how it operates and required mindsets. It will also include learnings regarding the benefits and challenges of the approach a review of the strengths and weaknesses of the approach and optimal operational contexts. Finally, it will include learnings regarding the similarities and differences of the approach versus the Thinking Skills Model of Creative Problem Solving.

### Project Timeline

Activities/Tasks	Complete By	Time Required (Hours)
<b>1. Concept Paper</b>		
1.1 Complete draft version of concept paper	9/5	13
1.2 Finalize concept paper	9/19	4
<b>2. Literature Review</b>		
2.1 Create final list of books, articles and publications	9/3	5
2.2 Obtain key books, articles and publications	9/10	3
2.3 Read/review books, articles and publications	10/1	25
<b>3. Design Thinking Practitioner Interview</b>		
3.1 Contact practitioner to schedule interview	9/19	2
3.2 Develop interview guide	9/26	2
3.3 Execute interview	10/3	4
3.4 Summarize interview	10/6	4
<b>Submit Sections 1-3: Section 1 (Purpose and</b>	10/17	15

<i>Description of Project and Rationale), Section 2 (Literature and Resources) and Section 3 (Process Plan and Project Timeline)</i>		
<b>4. Formal Instruction</b> - "Design Thinking for Innovative Problem Solving: A Step-by-Step Project Course"		
4.1 Complete course (further detail regarding topics by timing to be provided when syllabus is obtained on 9/15)	11/10 (begins 9/15)	20
<b>5. Design Challenge (Application Component)</b>		
5.1 Approve design challenge with Professor Liedtka	9/5	2
5.2 Share design challenge with target group	9/12	2
5.3 Assess current state (needs assessment current frame)	10/3	10
5.4 Create hypotheses/imagine future state	10/17	5
5.5 Converge (criteria: customer value and profit potential)	10/24	5
5.6 Refine and prepare for implementation	11/7	10
<i>Submit Sections 4-6: Section 4 (Outcomes), Section 5 (Learning Goals and Evaluation) and Section 6 (Conclusion)</i>	11/15	20
<i>Submit Sections 1-6</i>	11/22	20
<b>6. Final Presentation</b>	12/5	3
<b>Total Hours (estimate)</b>		174

#### Section Four: Outcomes

As a result of this project I had three key outcomes: completion of an online course in design thinking, application of design thinking to a challenge and a recommended solution to address the challenge.

#### Completion of an Online Course in Design Thinking

The course I completed was "Design Thinking for Innovative Problem Solving: A Step-

by-Step Project Course” which ran from September 15, 2014 to November 10, 2014 (Liedtka, 2014). This course offered in-depth instruction in the design thinking problem solving process, including key steps and stages, appropriate criteria for design challenges, evaluation tools and techniques, how to incorporate prototyping, screen for profitability and plan for implementation (Liedtka, 2014). Materials were delivered, and learning obtained, through a combination of viewing recorded video instruction, text readings and case studies, fieldwork, assignments and interaction with peers. An overview of the process is provided (Figure 4.1).



Figure 4.1: Overview of Design Thinking Process

### Application of Design Thinking to a Challenge

The challenge to which I applied this design thinking approach was owned by a consulting firm in New York City. This was done over the time period of September 15, 2014 to November 10, 2014. This approach contained several critical steps. The first was a creation of a design brief, the purpose of which is to clarify scope of project, its intent, the question it hopes to explore and the target group of stakeholders (internal and external) to explore them with. The design brief is provided (Figure 4.2).

<b>Project Description</b>	Consultancy X may be able to better deploy its current talent, employ the proper staffing model (mix of creative/analytic), understand when to hire new talent, and complete projects according to a pre-determined schedule by improving its understanding of the work that needs to get done for a new project.
<b>Scope</b>	<p><u>What is inside the scope of this project</u></p> <ul style="list-style-type: none"> <li>- RFP preparation</li> <li>- How new projects are evaluated (due diligence)</li> <li>- How new projects are staffed</li> <li>- How projects are organized/what they “drive to” (today – milestones are meeting dates with clients)</li> <li>- Level of desired client engagement, i.e. desire by the client (co-creation)</li> <li>- Actual hours for representative sample of past projects</li> <li>- Talent capabilities and tenure</li> <li>- Current recognition and incentive plans</li> <li>- Customer satisfaction</li> </ul> <p><u>What is outside the scope of this project</u></p> <ul style="list-style-type: none"> <li>- Business model</li> <li>- Current methodology/new service offerings</li> <li>- Hiring process</li> <li>- Pipeline/sales strategy</li> </ul>
<b>Constraints</b>	<p><u>Constraints</u></p> <ul style="list-style-type: none"> <li>- Project must be completed by week of November 3, 2014</li> <li>- Only conduct research for unknowns (leverage as much existing information and data as possible)</li> <li>- Optimize/limit time with Senior Leadership, Practice leads, Directors, Consultants and Associates.</li> </ul> <p><u>What requirements must a successful solution meet (outcomes the project must accomplish for stakeholders):</u></p> <ul style="list-style-type: none"> <li>- Simple, straightforward and standardized</li> <li>- Holistic (looks across enterprise)</li> <li>- Take talent development into account</li> <li>- Take profitability into account</li> <li>- Provides visibility into staff availability</li> <li>- Able to be modified as learning about the project evolves</li> </ul>

Figure 4.2: Design Brief

Another key step was the creation of design criteria. These criteria represents the ideal end state of the project and provides the measurement by which potential solutions will be evaluated. The design criteria are provided (Figure 4.3).

Design Goal	How to better understand, and plan for, the work that needs to get done.
User Perceptions	<ul style="list-style-type: none"> <li>- Set better expectations with the client (including a section of the proposal with caveats and assumptions).</li> <li>- Be more thoughtful about staffing and consider, and communicate, decisions drive by current utilization, how assignments are made and development needs.</li> </ul>
Physical Attributes	N/A – this is a challenge related to understanding and process.
Functional Attributes	<ul style="list-style-type: none"> <li>- Tell us when to stop working on a project (because the outcome is sufficient/meets the clients expectations).</li> <li>- Allow us to outline/articulate the deliverables in between.</li> <li>- Account for advisory and expertise and client relations time by the core team on a project.</li> <li>- Consider client dynamics (who are stakeholders, what are the politics, how is it staffed on their end, who is decision maker, are we also teaching).</li> <li>- Align incentive structures for business development and the project team.</li> </ul>
Constraints	- Allow us to maintain flexibility longer than we have it (on research, inputs, deliverables, client engagement model, etc.).

Figure 4.3: Design Criteria

A third critical step was to brainstorm ideas against design criteria. In this step, I used a variety of tools to help the group diverge, including Forced Connections and SCAMPER.

Photographs from the brainstorm session are provided (Figure 4.4).



Figure 4.4: Brainstorming Session

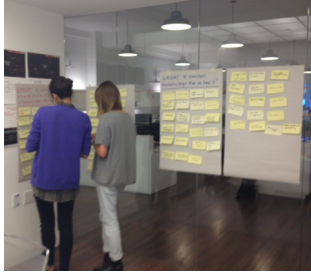


Figure 4.4: Brainstorming Session



Figure 4.4: Brainstorming Session

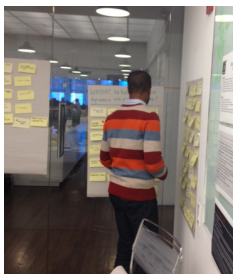


Figure 4.4: Brainstorming Session

A fourth key step was the creation of napkin pitches. Napkin pitches provide a consistent format for summarizing and representing concepts and ultimately allow for them to be easily compared, and prioritized, against one another. This is important as resources are often finite and decisions need to be made regarding which one (or which few) to develop further. An example of a napkin pitch of one of the concepts is provided in (Figure 4.5).



<b>CONCEPT NAME:</b> Client Diagnostic	
<p><b>The Big Idea</b></p> <p>Diagnose clients and client organization on key elements, as the engagement kicks off, to maximize effectiveness and efficiency of the engagement. The diagnostic will be delivered casually (i.e. will not be a questionnaire for them to complete). Key elements to be diagnosed (assessed up front so that they can be planned for) include: decisions makers, stakeholders, level, experience with innovation, size of team, whether this is the primary contact's only project, culture and politics).</p>	<p><b>Needs/Benefits</b></p> <p>Stakeholder - Those planning and working the engagement need this, this includes Consultants and Engagement Managers.</p> <p>Unmet need - None of this information is captured today and it dramatically impacts that time that must be allocated for client management.</p> <p>Stakeholder benefit - Armed with this information, those scoping and planning time for a project will be better able to forecast time that needs to be allocated for client management.</p>
<p><b>Execution</b></p> <p>Delivery - a team will need to brainstorm a list of all of the information that needs to be identified and how, exactly, to get it in a casual, unobtrusive and non-threatening way (could even be done via a game).                  Asset leveraged - Relationship management skills of Engagement Managers.                  Capability required - Strong relationship management skills (Business Development and Project Lead).                  Partners needed - n/a.</p>	<p><b>Business Rationale</b></p> <p>Understanding, and planning for, the time a client will require directly relates to the primary design objective, "How to understand, and plan for, the work that needs to get done." Client management is a big piece of "the work".</p> <p>Opportunity cost will be to Business Development and Project Leads who are not gathering this information today. Time spent gathering this information will come at the following costs:</p> <ul style="list-style-type: none"> <li>- Business Development: will take time away from developing business (prospecting, closing deals).</li> <li>- Project Lead: will take time away from getting started on project deliverables.</li> </ul>

Figure 4.5: Napkin Pitch

A final key step was to create prototypes of concepts. Prototypes are visual, low fidelity representations of concepts used to elicit feedback. The goal of the prototype is to learn about, not to test, the concept. An example of one of the prototypes used is provided (Figure 4.6).

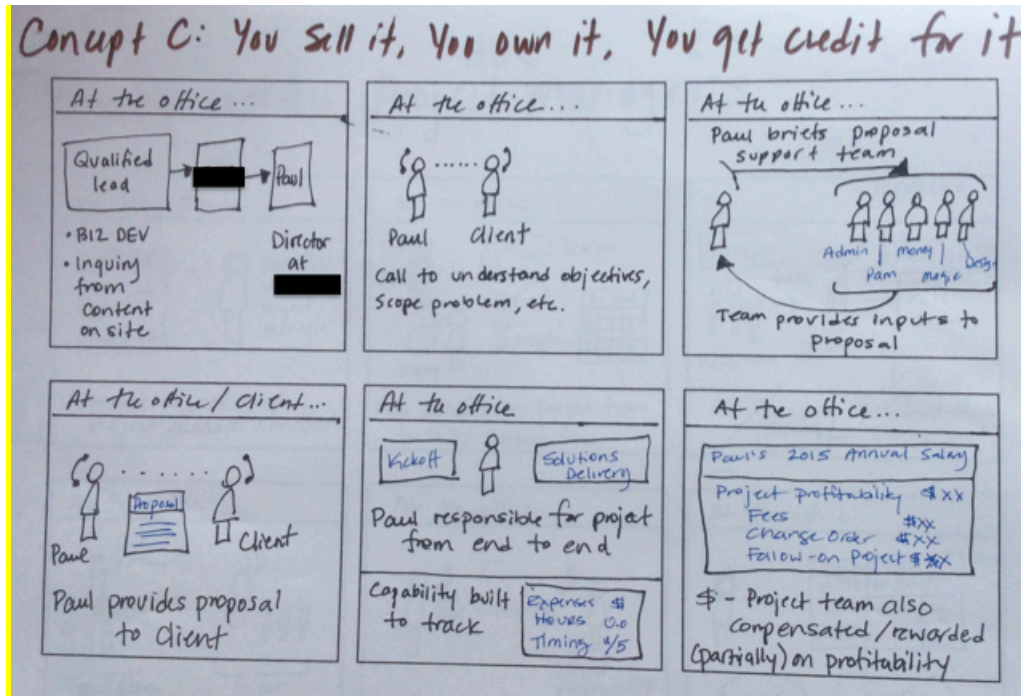


Figure 4.6: Prototype

**Recommended Solution**

The third, and final, key outcome of the overall project was a final recommendation for the consulting firm for an innovative solution to address their challenge. The solution presented was a synthesis of two key concepts produced by applying the design thinking approach.

**Section Five: Key Learnings**

This project afforded me with significant learnings as they relate to both content and process.

**Content Learnings**

From a content perspective, I gained a thorough understanding what design thinking is (its principles), how it operates (the process) and how to apply it in organizations. I now also understand the criteria to apply to challenges to assess their appropriateness for design thinking, the environments in which it works best, as well as key tools used in the approach.

Also related to content, I am now conversant in the key differences between design thinking and Thinking Skills Model of Creative Problem Solving (Puccio, Murdock, & Mance, 2007). While both methodologies can effectively be used to arrive at novel solutions, they are quite different in their approach. The three biggest differences between the two lie in the design thinking's problem focus and its focus on empathy and prototyping.

Regarding problem focus, it's critical that the problem to be addressed with design thinking be human centered and key to the approach is conducting an actual experiment in a real environment with people. The Thinking Skills Model of Creative Problem Solving doesn't include this criterion when defining problems or opportunities appropriate for the approach nor does it include an experimentation "step" (Puccio, Murdock, & Mance, 2007).

Related to its user-centered focus, design thinking places a significant priority on empathizing with users. So critical is this in-depth understanding of what users are thinking, feeling, doing and thinking related to the problem that empathizing with users occurs throughout the entire problem solving process, not just in early stages of the process. The Thinking Skills Model of Creative Problem Solving touches on some of this same information, but it's limited to the beginning of the process where key data around the problem or challenge is shared (Puccio, Murdock, & Mance, 2007).

Perhaps the biggest difference of all, however, is design thinking's use of prototyping throughout the problem solving process. Prototyping occurs early and often in the process, with early prototypes often consisting of simple, two-dimensional drawings, with later versions taking a more refined three-dimensional form. Prototyping elicits valuable feedback and learnings from users, both of which serve to inform later prototypes until a final solution (or version) is reached. The Thinking Skills Model of Creative Problem Solving does not employ the use of prototypes

at all (Puccio, Murdock, & Mance, 2007).

### **Process Learnings**

The first step of the process required me to identify an opportunity (or problem) to serve as the challenge on which to apply the design thinking process. My key learning here was the importance of ensuring that the problem was human-centered as the process isn't effective without a target user. I also grasped that when designing the future, most likely, key data around the challenge does not exist or isn't relevant. And, I now understand that a great candidate problem for design thinking is one where stakeholders can't agree on the problem, much less the solution.

In the second step of the process, project scoping, I realized how important it was not to make assumptions about someone's awareness of (and fluency with) a tool. I used a fairly well-known problem scoping tool called "Why, What's Stopping You?" and was surprised to learn that those in my client's company were not familiar with this tool, given the focus of its practice. I also learned that it's critical to have a primary sponsor or problem owner. Application of the scoping tool produced many elements that were stopping the consultancy, and it was key to have one individual choose from among them (especially as there were differing opinions in the room).

From drafting the design brief, the third step in the process, I grasped the importance of indicating what is in and out of scope for the problem or challenge. Doing so helps to constrain the overall exercise and also serves to set expectations among stakeholders. I also learned the importance of identifying the target for the initiative, understanding that there may be primary, secondary and tertiary targets. And, I saw that the brief evolved as my understanding of the problem evolved. For example, at first I identified the consultancy's executive team as the

primary target, but as I got deeper in the process, the target evolved to be the consultants. I also learned the importance of articulating expected outcomes as it helps to align all involved.

From the fourth step in the process, which concerned making plans for how (specifically) I was going to execute the rest of the process, I realized the importance of careful consideration before committing to a specific research tactics. I saw that there were many factors that went into such a decision, such as time, nature of the challenge and access to stakeholders and research subjects. I also learned how critical it is to determine, up front, who will be involved in which step of the process, specifically, which stakeholders and supporters to include and rely on. And, I gained an appreciation for the need to plan, but also stay flexible. As the process got under way, it was necessary to me to adjust the types of tools I was using.

From the research step, I realized how important it was to get a team to assist you (I did not have one). I conducted eleven ethnographic interviews and eight journey mapping sessions and was a bit overwhelmed compiling elements to share in the next step, identifying insights. I also experienced that it was critical to record the sessions so that I could be attentive to my research subject. I grasped the effectiveness of open-ended phrases such as, “Tell me more” and the importance of being silent (wait long enough and the subject will share something meaningful). Finally, my most critical learning was to be sure to establish rapport up front. Spending a few minutes doing so before the session relaxed research subjects and created a connection with them. I could tell a big difference in the tenor of my research interviews based on whether or not I had taken the time to establish rapport up front.

For me, the step in which insights were identified was the hardest step of the process. In this step, participants reviewed key research data, identified themes in the data and then created insights by asking, “So what?” about the themes identified. I learned that it was critical to build

in ample time for this step and to stay calm, cool and collected when it seemed like the group wasn't getting to a good outcome. And, I recognized the importance of setting ground rules with the group up front to keep them on task and prevent excessive discussion. I also learned that it's key, up front, to give context for this step (this is a learning that I realized in this step, but translated across all steps). Explaining how this step fit with the rest of the process served to make the group more accountable and less apt to waste time.

Establishing design criteria, the seventh step of the process, involved looking at the insight and answering the question, "If anything were possible, our ideal solution would...". While this was fairly easy to do, I realized that it was important to have individuals in the group who were adept at synthesizing. I also learned that it was key to "park" outliers (insights that weren't related to the data reviewed) in order to keep the group on track.

Because of my proficiency with brainstorming, step eight of the process, I had the least amount of learning here. One thing I did recognize, however, was not to equate a group's fluency with their productivity. Because of the type of professionals with whom I was working, they were very fluent and ideas came easily. However, they also needed to introduce ideas and process them out loud versus just stating them and moving on to another idea, compromising productivity (quantity of ideas). Because of this, I realized that I should have spent more time, up front, with ground rules.

The concept development step of the process involved looking for intriguing and compelling combinations of ideas. This step was new for me and I found it challenging (as did my client). I learned to use tools to assist this step, specifically, the morphological matrix. Regarding use of this tool, I realized that it wasn't necessary to have participants create concepts by choosing an option from *each* column in the matrix as this felt a bit artificial and contrived.

The group produced better results when they selected what most resonated with them from just a few columns.

The next step involved standardizing each concept into a “napkin pitch” so that they could be easily compared, and prioritized, against one another across key dimensions (with limited resources, it was only feasible to move forward with a few concepts). In completing this step, I learned the value of considering the ability to execute a concept and identifying what asset or capability the concept could leverage or would require, respectively. I also came to understand that, when it comes to internal projects, while there is no hard cost to an individual of adopting proposed solutions, it’s important to consider other costs, such as the opportunity cost of their time.

The next step, identifying assumptions – what must be true for the concept to succeed -- was new for me. In this step, key assumptions around the concept were identified to be tested in the next step, prototyping. From this step I realized that that the most critical assumption to test is the value assumption – will customers pay for it? Or, if the concept is internally facing, will people adopt it? And, I learned that it’s important to assess the extent to which the concept is executable – can the organization do it, does it have the knowledge, resources and capabilities? Finally, I grasped how to think about different ways to gather data to test assumptions, these ways ranged from gathering existing data to executing simulations and prototypes.

In the next step, making prototypes, I gained an understanding of the importance of bringing a concept to life visually and in low fidelity. The former is the key to getting potential users to provide rich feedback about a future that doesn’t yet exist. The latter is critical as, if potential users view the prototype as polished and finished, they are to share their ideas about how it might be improved or completed. I learned the key elements of a storyboard, which

include the setting, figures, thoughts, actions and speech. Finally, I saw that, as they include few words, storyboards need to be narrated in feedback sessions with potential users.

In getting feedback from potential users about the prototype, the next step, I learned that it was important to first check for comprehension. I also realized the value of starting conversations broadly with questions such as, “What are your first impressions?” or “What jumped out at you?”. I gained an understanding of the importance of using open-ended questions and explicitly asking what potential users liked about the concept as well as how it might be improved. Finally, I learned that it was critical to ask them if the concept was “for them” – this explicit question related directly to the value assumption (would they buy it or adopt it?).

For me, given that my client’s concepts for potential solutions were internally facing, the last step of the process was to design a learning launch to test final assumptions. A learning launch is a quick and inexpensive in-market experiment with potential users and a refined prototype where users are both interviewed and, most importantly, their actions are observed. In designing a learning launch, I realized that by placing strict constraints on time and resources, I was able to produce creative approaches. I also learned that it was critical to outline, up front, the assumptions to be tested so that the launch was as focused as possible and critical learnings were obtained. Finally, I found that it was necessary to test one assumption with multiple stakeholders, which meant that I needed to consider how to get information from a variety of different groups of people.

### **Section Six: Conclusion**

Learning and applying the design thinking process has been a truly transformational experience for me. As a result of this new knowledge, I see myself operating differently, both



professionally and personally.

### **Professional Changes**

First and foremost, I see myself ensuring that stakeholders are aligned on the current state before making any attempts to define an ideal future state. Unless we can agree on where we are, we'll all have different perspectives on where we need to go.

I also see myself gathering data related to potential solutions (especially as it relates to user needs and desires) versus debating their efficacy with others. As the future state doesn't yet exist, debates related to it waste both time and energy.

I greatly valued the research tools I used in the project – journey mapping and ethnographic interviews – and I see myself seeking further training in both. As it relates to future research sessions, I also see myself prioritizing establishing rapport with research subjects.

At the outset of problem-solving endeavors, I see myself spending time thinking through design criteria carefully. I also see myself further exploring how (and whether to) incorporate these criteria into brainstorming.

In creative problem processes I have applied thus far, ideas are strengthened to form solutions. But, what I know see myself doing is considering intriguing ways to combine ideas to create concepts, more comprehensive and robust than ideas.

I also see myself incorporating prototyping into all future creative problem solving efforts. Allowing users to participate in a “work in progress” engages them, provides them with a sense of purpose and ownership and contributes enormously to the quality of the solution. I have experienced, first hand, how people delight in being part of the process and the value of their contributions.

And, I see myself starting small. Over the course of my career, I have been involved in

many new product launches which suffered significantly from failing to recognize the value of conducting small in-market learning experiments before executing a full-scale launch. I see how starting small can dramatically de-risk innovation initiatives and increase their chance of success.

I also see myself spending the time, at the beginning of innovative initiatives, thinking through how to best measure their impact. While this includes tangible, in-market results, I see myself adding the softer (yet equally as important) outcomes such as changes in the team members' satisfaction, engagement, perceptions, behaviors and beliefs.

### **Personal Changes**

Finally, I see myself being deliberate about cultivating and maintaining a learning mindset. Being open to new possibilities and tolerant of ambiguity are the keys to success in both innovation and life! In the words of one of the most creative among us, Steve Jobs, "Stay hungry, stay foolish" (Jobs, 2005).

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