EXCHANGING THE 4P'S OF CREATIVITY

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1. INTRODUCTION

In 2011, design thinking was called a "failed experiment" and was declared dead (Nussbaum, 2011). The original premise for exporting design thinking is that by knowing how designers approach problems and the methods which they use to ideate, select and execute solutions could improve problem solving processes in other domains (Cross 2011). Design thinking was introduced as a prototype, and like most prototypes, testing exposed weaknesses. Two weaknesses that were revealed early in the design thinking experiment were (1) that design thinking principles and methods could not be divorced entirely from the design thinker and (2) that design thinking could not live and flourish in any domain. These weaknesses are not terminal.

Design thinking is defined as combining "empathy for the context of a problem, creativity in the generation of insights and solutions, and rationality in analyzing and fitting various solutions to the problem context" (Kelley, 2013, pp.19-20). A significant part of design thinking is the aspect of creativity, the generation of new and useful ideas.

In 1961, Mel Rhodes attempted to find a single definition for the word creativity. After reviewing over 40 definitions of creativity, he was still unsatisfied; however, in this pursuit he found themes that overlapped and intertwined. Consequently, he created his own definition in an article titled, "An Analysis of Creativity," where he defined the 4P's as:

- Person: understanding the traits, characteristics or attributes of the creative person;
- Process: describing the operations or stages of thinking used in the creative process;
- Press: examining the nature of situations and its context within the creative press (or environment); and
- Product: identifying outcomes and qualities of creative products.

Mel Rhodes developed an important framework to think about, talk about, and understand creativity. We can use this framework to discuss design thinking, exchanging his 4P's of creativity for the 4P's of design thinking. This paper attempts to reframe the 4P's of creativity through the lens of design thinking—talking about creativity as an aspect of design thinking, but also creativity as it relates to the design practitioner and the designer's domain. For the purposes of this discussion, person, process, press, and product have been separated into individual categories, but it is important to recognize that in practice the 4P's are involvedly interconnected.

2. ATTRIBUTES OF A CREATIVE PERSON

Tim Brown (2014 pp. 23-25) of IDEO says: "For a long time we were only talking about one piece, which is design thinking. The other part is 'creative confidence.' The design thinking process is messy and complex. People are afraid of that, and that stops them from continuing. They're afraid to take risks. They're afraid to explore something new. They're afraid to go from talking about something to doing it. All this relates to creative confidence. Creative

confidence is a mindset, and if you don't have it you will not be equipped for design thinking." Confidence is one of a number of important character traits of creative thinkers. The following sections discuss some of the other mindsets of successful design thinkers."

2.1 PERSON AS CURIOUS

Design thinkers are curious. The type of curiosity that suggests creativity is demonstrated in a persistent reluctance to take things for granted, a deep desire for explanations, and a suspicion of obvious explanations. Design thinkers are aware and observant of the world and have a desire to explore, discover, and learn (Nickerson, 1999). Design thinkers ask questions; they want to know who, what, when, where, how, and why. "The first step toward a more creative life is the cultivation of curiosity and interest, that is, the allocation of attention to things for their own sake" (Csikszentmihalyi, 1996, p. 346). When we talk about a creative/design process we invariably mention design research methods. But, "research is formalized curiosity. It is poking and prying with a purpose" (Hurston, 1942, p. 174).

2.2 PERSON AS JUDGE

Design thinkers have the ability to judge; to recognize, evaluate, and push forward interesting ideas and insights. Judgment of the creative person, or the "evaluative component," as Mark Runco calls it (1994 pp. 63), is typically overlooked, but it is at least as important as any other component of creativity. This judgment comes from mindfulness of culture, attitudes, values, and behaviors of people and an awareness of usefulness and value. This awareness comes from being curious, but it adds a level of being able to make meaning out of what is observed. "The very essence of the creative [product or idea] is its novelty, and hence we have not a standard by which to judge it" (Rogers, 1995 p. 351), so the designer must make judgments.

2.3 PERSON AS COURAGEOUS

Design thinkers have a need to try new things, and in trying new things they risk failure. They have the courage to go against learning and habits, which can lead to stereotypic ways of thought and action, and they demonstrate a willingness to bend the rules, break traditions, and question authority and bureaucratic structures. They have the courage to not worry about looking foolish, being criticized, or making a mistake, and they are willing to take risks and work hard (Davis, 1999). Designers are willing to challenge assumptions, manipulate constraints, and ask hard questions in an effort to discover the truth. This takes courage, a trait Abraham Maslow (1971) found in creative people. He found creative people's behavior seemed less blocked and less self-critical. These people had "the ability to express ideas and impulses without strangulation and without fear of ridicule from others," which "turned out to be an essential aspect of creativeness". "Creative people are relatively unfrightened by the unknown, the mysterious, the puzzling, and are often positively attracted by it" (Maslow, 1971 p. 21-30).

2.4 PERSON AS ADAPTABLE

Design thinkers are adaptable in their thinking. They continue to be resistant to the pressure of conformity, they hold ideas lightly, they have a tolerance for ambiguity, they are adaptable to change, and they are open to new ideas. They bring chaos to order and order to chaos. They deconstruct and reconstruct things in order to understand and to see things differently. In order to bring order to chaos, they must be willing to tolerate the chaos and to play in the mess for extended periods of time without getting hitched to an idea too soon. This idea of holding ideas lightly or letting go of a good idea to pursue more and maybe better ones shows a willingness to experiment, explore, and play with ideas.

Creative people and designers can reframe problems and find new points of view. Mindfulness, as Bruner (1962) has put it, is "a willingness to divorce oneself from the obvious and is surely a prerequisite for the fresh combinatorial act that produces effective surprise" (p. 12). "The ability to see things from different perspectives, especially novel and unusual perspective, and the willingness and ability to change one's perspective—to reformulate a problem on which one is making little progress—have been stressed by many investigators as an important aspect of creative thinking" (Sternberg & Lubart, 1992).

"In order for a creative response to be produced . . . it is often necessary to temporarily 'step away' from the perceived goal, to direct attention toward seemingly incidental aspects of the task and the environment." The more single-mindedly a goal is pursued, the less likely it may be that an alternative solution path with be explored (Amabile, 1983, p. 360).

2.5 PERSON AS PERSUASIVE

Design thinkers know how to craft a story. They can tell a concise, unique, concrete, credible story that will engage and persuade their listeners. If you cannot persuade the world that you have a creative idea, how does the world know that you actually had it? "It is impossible to separate creativity and persuasion; the two stand or fall together" (Csikszentmihalyi & Wolfe, 2000, p. 83). Having knowledge but lacking the power to express it clearly is no better than never having any ideas at all (Pericles 429 BC).

3. ATTRIBUTES OF A CREATIVE PROCESS

The term *process* refers to thought processes not methodology. When we talk about the creative process, we are talking about principles and methods and how they are applied in a very heuristic way. Design thinkers think about principles and methods as ingredients; the same ingredients applied in various ways can yield a variation of results, all of them potentially good. Roger Martin (2012), dean of the Rotman School of Management, said we, referring to businessman "must think like designers—more 'masters of heuristics' than 'managers of algorithms.'" (p. 5).

With creative problems, the path to the solution is not completely straightforward. In many cases, heuristic tasks do not have clearly defined solutions or goals, and it is part of the designer's task to identify them. "Problem discovery is an important part of much creative activity" (Campbell, 1960, pp.380-400). There is reason to expect that problem construction may be an especially important determinant of creativity in these circumstances (Mumford 1994). With an ability to excel by asking the right question and finding the right problem, creators can define and "see" the boundaries of their fields that can be extended or broken. Being able to find a solution isn't the first step; the first step is being able to ask the question that focuses the vision and the potential. This creative process of problem finding and defining is one of the promises of design thinking.

This thought process has ingredients (principles) and methods (tools that apply to the principle). Mel Rhodes used a process defined by Graham Wallas (1926) in his book *The Art of Thought,* Wallas quotes the German physiologist and physicist Herman Helmholtz who shared his lifelong process into these four familiar principles: preparation, incubation, inspirations and verification. There are numerous versions of these principles all go by

different names. The names are different but the descriptions are similar. This paper uses the acronym "USERS" as a tool to remember the principles. USERS stands for understanding, shaping, exploring, refining and sharing. These principles are outlined in the following sections.

3.1 PROCESS AS UNDERSTANDING

The principle of understanding relates to the curiosity and problem finding character traits. Using methods to accumulate evidences in the problem space is to have material to play with. For designers, this is understanding the human-value aspects of the problem, what Stanford's D School calls "extreme empathy". Methods like observation, experience, and inquiry help a designer to appreciate, get acclimated, and comprehend the problem space. It helps to get a vision of how people's actions, environment, and artifacts all relate. This is not just data collection; it is the mental material, understanding the chaos that will be organized into meaningful insights. This is where the creative character trait of curiosity is applied, the "poking and prying with a purpose" (Hurston, 1942, p. 143).

3.2 PROCESS AS SHAPING

The principle of shaping uses methods to organize, simplify, and clarify the problem to help develop unique insights from the information collected: to synthesize. "A problem well-stated is a problem half-solved" (Kettering, 2014), and "The mere formulation of a problem is far more essential than its solution" (Einstein, 2000, p. 92).

Creativity uses the idea of thinking outside the box, but it applies less to design when we work within the constraints. We explore every corner of the box and sometimes challenge the shape of the box, but we always have constraints that are worked within. In truth, creativity expresses itself more powerfully as the constraints multiply. It is easy to be creative with no constraints, but more difficult to express when the constraints are many. Frank Lloyd Wright (2000, p. 286) said, "Man built most nobly when limitations were at their greatest."

Usually creativity is associated with divergent thinking, but problem shaping is creative convergent thinking—taking data and making it meaningful.

3.3 PROCESS AS EXPLORING

The principle of exploring or ideation using encoding methods like questioning, comparing, and combining to explore a wide variety of ideas from numerous points of view (Sternberg, 2000). This ties back to adaptability as character traits.

3.4 PROCESS AS REFINING

The principle of refinement is another creative convergent-thinking process that uses methods to visualize ideas, then to validate them and make changes this convergent cycle can repeat numerous times, each time leading to a better solution if good judgment is employed. We visualize ideas by sketching, rendering, diagramming, modeling, and prototyping. If we look at the word *prototyping* as meaning "first impression," any visualization can be called a prototype. In this instance, we are talking about prototyping as a communication tool to move an idea forward.

3.5 PROCESS AS SHARING

The principle of sharing uses showing, demonstrating, and describing to communicate ideas to others in a compelling and persuasive way. Designers are in the business of communicating ideas. Designers employ a

variety of tools to communicate their ideas in concrete ways. Sketches, diagrams, and renderings show ideas; models and prototypes demonstrate ideas; and stories describe ideas. Each tool communicates a different stage of the process and is used either to stimulate conversation or to focus direction.

There are other aspects of the process, but these are the aspects that are more closely associated with creativity and design.

4. ATTRIBUTE OF THE CREATIVE PRESS

"Press" comes from the Latin word *pressus*, meaning "a box or container." This is the environment that effects the creative person, process, and product. Press is the outside elements that press in on or constrain designers, helping or hindering their creative manifestations. The design-thinking prototype tried to export a heuristic thought process into highly algorithmic domains. These more linear-thinking disciplines look for a series of steps to achieve a consistent and predictable result. People also have to be resistant to the more linear environments in which design thinking takes place.

4.1 PRESS AS HABITAT

Design thinking depends on the right people working in the right place. We can be creative anytime and anywhere, but the physical environment can be an important part in allowing design thinking to flourish. There are many features of the creative environment, each supporting a different type of activity. A creative space could include the following conditions: stimulation, recognized as a place to be creative, where the mind is inspired or a thought process is triggered in some new way; a place of autonomy and focus, where independence, freedom, and uninterrupted time are allowed; and a place set up for collaboration, where the space makes it easy to work together. PARC's Computer Science Laboratory "built a near-perfect work environment for creativity: freedom to pursue passions, challenging goals, collaborative norms, sufficient time to really think, and the resources people needed to follow their dreams. Even the smartest, most passionate people won't thrive in—or will soon abandon—a work environment that stifles them" (Amabile, 2010).

4.2 PRESS AS CULTURE

Culture as press can help or hinder design thinking. Cultural elements remind us that we must conform, fit in, follow the rules, and to do it this way. One of the main functions of social systems is to maintain the status quo (Merton, 1968). Because design thinking disrupts the status quo, it's often not welcomed. Risk-taking is essential to creativity and needs to be rewarded, not punished. The culture should communicate it is OK to try new things, to challenge assumptions and constraints, and to fail.

4.3 PRESS AS MANAGEMENT

Management can challenge creative people with a vision of what needs to be done but also provide them the autonomy to decide how to accomplish the task. Hatcher (1989) study found a positive relationship between autonomy and creativity. Management can provide adequate amounts of time and sufficient resources to experiment with ideas. Management can have a negative effect on creativity if the urge to control isn't resisted. The principle of leveling is at play here—too much structure is restricting and too little structure is confusing, the key is finding balance.

4.4 PRESS AS RELATIONSHIPS

Relationship as press represents a trusting, open, safe, and collaborative associations for sharing, critiquing, and building ideas together. A positive press would allow for relaxed, diverse, playful relationships. While negative relationships have a diminishing effect of design thinking (Davis, 1999, p. 190),. Strong friendships aren't good for design thinking because we tend to have close relationships to people who are like us, and as a result, it's less likely that a person will encounter a surprising new point of view from a friend; ultimately, hearing the same views doesn't contribute to novel and useful ideas (Perry-Smith, 2006). Relationships that are good for creativity allow for creative tension as people engage in debate, critique, and conflict over ideas, points of view, and issues.

5. ATTRIBUTES OF A CREATIVE PRODUCT

Creativity is the ability to produce work that is both novel [original, unexpected, unique, surprising, new] and appropriate [useful, has value, purpose, meets need] (Sternberg & Lubart, 1996, p. 677-688). This produced work is what Rhodes called "product." This product could be defined as an artifact, system, or service. A creative product "has to satisfy certain criteria, not only functional, but also psychological and aesthetic.

Jackson and Messick (1965, p. 309) proposed that "creative products [novel and useful] elicit a distinct set of aesthetic responses from observers: surprise, satisfaction, stimulation, and savoring."

5.1 PRODUCT AS NOVEL

The creative product is novel, original, unexpected, unique, surprising, and new. The level of uniqueness can vary from evolutionary to revolutionary. A product must have an element of uniqueness to be called "creative." It is very hard to judge anything as novel in isolation, so when we are confronted with novelty, we tend to compare new things to very close alternatives. Factors that distinguish one item from another get our attention, and we consider this as novel. Products in one domain may not be considered novel, but change the context and the products become unique.

5.2 PRODUCT AS USEFUL

Creative products should not be just different, they should be better. This means that novelty and usefulness are connected. The aspects of creative products, from a design thinking point of view, are novel and useful in making a human connection. Human connections made through need finding and defining, appropriate aesthetics, and making meaning.

5.2.1 NEEDFINDING AND DEFINING

From a design point of view, useful products solve problems for people. Regardless of whether these problems are real or perceived, the designer's role is to uncover and understand these needs.

Useful products would enable or improve a user's ability to complete the desired task. Creative products should be designed in such a way that its purpose is obvious, and interactions with the products should be functional and enjoyable. Useful products should be understandable in a way that the functions don't differ from the user's observations; if they do the designer has created conflict. A product's appearance should reinforce its function, making it obvious what the user should do with it. Useful products create parameters that guide the user towards the proper interactions, through the use of good affordances and use of appropriate conventions.

5.2.2 APPROPRIATE AESTHETICS

Of appropriate aesthetics Dieter Rams says, “the [appropriate] aesthetic quality of a product is integral to its usefulness because products are used every day and have an effect on people and their well-being. Only well-executed objects can be beautiful.” Appropriate aesthetics clarify “the product’s structure and makes the product clearly express its function by making use of the user’s intuition” (qtd. In Lovell, 2011). Appropriate aesthetics connects perfectly to culture, context, form, material, process, environment, and function so that all elements are so completely integrated as to be dependent on one another for success.

5.2.3 MAKING MEANING

Meaning can be provided to a product by redefining or reinterpreting an object or by making some type of commentary on the object or the object’s entire culture. Meaning comes from elements of delight, humor, surprise, and personality. Objects have meaning when they express specific things about themselves or their importance. Products have meaning when there is a strong emotional tie or reaction with the viewer, making it provocative. Products have meaning when the connotation associated with it are as important as, or supersedes, form and function. Products have meaning when they have a hidden message or levels of interpretation of the message. Products have meaning when they allow the designer creativity and interpretation beyond the original intention. Products have meaning when they connects users to a culture or brand that they want to be a part of.

6. CONCLUSIONS

Is design thinking a failed experiment? Is design thinking dead? Like most design thinking problems, design thinking itself was prototyped and validated, and is now in the process of being restated. Two aspects that need to be added to the original design thinking process prototype are the attributes of person (the design thinker) and the press (the design thinking environment). In other words, you can’t separate person, process, and press if you want novel and useful results. If we will exchange the 4P’s of creativity to design thinking we will provide design thinking with new vigor and life.

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