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Connecting the Cerebral and Heartfelt: Integrating Creative Problem Solving and Design Thinking

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Connecting the Cerebral and Heartfelt:
Integrating Creative Problem Solving and Design Thinking

by

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An Abstract of a Project

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ABSTRACT OF PROJECT

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This paper reviews scholarly resources and industry articles exploring the challenges of understanding and implementing design thinking. Drawing upon these findings, I will develop a novel framework that connects the cerebral and heartfelt aspects of Creative Problem Solving with the more empathetic design thinking methodology. The purpose of this endeavor is twofold: first, to capture my understanding of the intellectual and emotional experiences encountered during a creative problem-solving journey, and second, to establish a unique human-centered design thinking framework that works to integrate elements of *Creative Problem Solving, the Thinking Skills Model*, providing a fresh perspective to tackle frequent obstacles in comprehension and execution. Ultimately, this visualization and narrative will serve as a solid foundation for enhancing my future endeavors in facilitating, training, and writing on the subject.

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05/05/2023

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I dedicate this project to my partner, Matt, and my two children, Ella and Henrik, for their unwavering support and love.

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SECTION ONE: BACKGROUND TO THE PROJECT

Purpose and Description of Project

Traditionally, organizations created products and services based on their assumptions of customer desires, representing two perspectives. The first, viability, emerged from businesses asking, “Should we make this?” The second, feasibility, arose from engineers questioning, “Can we make this?” Focusing solely on economic viability and technical feasibility led to solutions that failed to address customers’ needs. What was lacking was the human perspective or the third dimension of desirability: “What do people genuinely need?”

Desirability evaluates whether a solution effectively addresses the appropriate customer issue. Design thinking melds desirability from a human standpoint with technological feasibility and economic viability (“What Is Design Thinking?,” n.d.). By immersing themselves in the problem long enough to grasp all its components, design thinkers achieve a harmonious balance between desirability, feasibility, and viability (Brown, 2019).

These overlapping elements are often conveyed visually as a Venn diagram (*Venn Diagram Illustrating Design Thinking*, n.d.), representing how design thinking combines human, technology, and business components. By considering user experience, human-centered design, and technological feasibility, design thinking balances these critical aspects to establish a robust foundation for innovative solutions.

Design thinking is a human-centered approach to creative problem-solving that prioritizes the development of meaningful solutions catering to human or customer needs. According to Brown (2019), design thinking has emerged from designers’ extensive experience in aligning human necessities with available technical resources while adhering to the practical constraints of businesses. Moreover, design thinking is particularly effective for tackling wicked problems,

where “pure analytical thinking, regardless of its level of expertise, cannot generate a solution” (Martin, 2009, p. 94).

Historically linked to aesthetics, the significance of capital “D” Design in the industry has evolved into a driving force, helping organizations adopt a more customer-centric mindset as a critical differentiator. As organizations strive to become more customer-centric, Design involvement must begin in the early stages of product strategy (where “product” also refers to any creative change). During these high-level planning discussions, “thinking like a designer” ensures that desirability balances viability and feasibility.

Tracing back to the 1960s and 1970s, design thinking as a practice historically began when researchers and practitioners began exploring and formalizing methods for addressing complex, ill-defined problems by combining creative and analytical approaches (Gibbons, 2016). The term “design thinking” emerged in the 1990s when David Kelley, Tim Brown of IDEO, and Roger Martin integrated various design methods and conceptual models developed over time into a unified framework (Gibbons, 2016).

Design thinking is versatile and applicable to many fields, as the cognitive process it involves transcends domain-specific constraints. Dell’Era et al. (2020) state that “design thinking is universally scoped, meaning it can deal with virtually any kind of problem in any domain because the generative cognitive process does not relate too closely to any specific field” (p. 326). This approach has fueled significant innovations in diverse areas such as literature, art, music, science, engineering, and business, demonstrating the applicability of design thinking (Dam & Siang, n.d.). Over the years, design thinking has matured into a systematic, human-centered methodology emphasizing empathy, collaboration, and iterative

problem-solving. As a result, it has been widely adopted across various industries to drive innovation and enhance user experiences (Gibbons, 2016).

Design thinking and Creative Problem Solving (CPS) are akin to two closely related intellectual frameworks, both eager to address complex challenges and ill-defined problems and foster creativity and innovation. Creative Problem Solving (CPS) and design thinking (DT) are often associated with these wicked problems because they focus on addressing complex, ambiguous, and constantly evolving challenges that cannot be easily understood, defined, or solved using conventional problem-solving methods. While the two approaches share many similarities, some (including myself) argue that design thinking is an evolution of CPS (Nunez, 2017). Their shared strength lies in their iterative process, characterized by idea generation and refinement in a cycle of learning and continuous enhancement. The ability to tolerate complexity and embrace ambiguity are cornerstones of these approaches, and my Creativity and Change Leadership Graduate Advisor at Buffalo State University, Gerard Puccio, clarifies that they represent essential life skills (FourSightOnline & Puccio, 2018). Both methodologies intertwine divergent and convergent thinking throughout the process, scrutinizing diverse ideas with a receptiveness to novelty before honing in on the optimal solution. Collaboration is integral to the success of design thinking and CPS, as they maintain that diverse perspectives and expertise give rise to a rich array of innovative and comprehensive solutions.

Both approaches exhibit a detective-like disposition in problem-solving, delving profoundly into the underlying causes and context to ascertain that the central issue is addressed rather than merely addressing superficial aspects. Although they share numerous commonalities, their distinct features, such as design thinking's unwavering emphasis on empathy and their

respective stages or steps, are prominently displayed. Ultimately, these methodologies represent two creative forces converging in pursuing innovation and exceptional problem-solving aptitude.

Despite its potential, design thinking sometimes encounters challenges related to its implementation and understanding. A simple Google search reveals numerous articles critiquing design thinking for its excessive focus on brainstorming and allegedly linear, prescriptive, and oversimplified nature. Carlgren et al. (2016) argue that design thinking could undermine traditional design practices by suggesting that "everyone can do design" (p. 346). As Christina Wodtke (2020, We are all DESIGNERS, section) cautiously warned, "It is human to design, but it is a profession to be a designer." Thus, it is crucial to differentiate between a designer in the design thinking context and a Designer in the professional realm. For clarity, I will refer to those who utilize design thinking as designers, with a lowercase "d," contrasting them with capital "D" Designers in the professional domain of Design.

Moreover, it is essential to acknowledge that any reference to a "product" in this paper aligns with Mel Rhode's Four P's model of creativity (Rhodes, 1961), where product refers to any manifestation of creativity, including creative artifacts, the criteria for determining originality, and the characteristics that signify a creative outcome (Miller et al., 2011a).

My objective is to delve into the CPS methodology thoroughly to improve the understanding and execution of design thinking strategies, ultimately supporting Designers and non-designers in navigating ambiguous situations and empowering them to make confident decisions about their next course of action. The intention is to encourage the view of these methodologies as guiding conceptual frameworks rather than rigid, step-by-step procedures.

Rationale for Selection

Picture this: it’s the late 1990s, and I'm starting my first professional gig as a web designer at a startup in London, UK. That's when I discovered my passion for tackling the right problem. With a degree in Biomedical Photographic Communications, BS from the Rochester Institute of Technology (RIT) in Rochester, New York, and no formal design training, I wrestled with my Designer title, which seemed to imply my sole purpose was to make websites look pretty. But I was far more intrigued by *the why* (the website's purpose) and *the who* (our target audience). As the Internet grew, I noticed it spawned a new issue: flashy experiences without substance, or even worse, simply unusable and detrimental from a usability and accessibility standpoint.

Cue my first exposure to Don Norman's *The Design of Everyday Things* in the early aughts, which ignited my desire to become a human-centered designer. Following this aspiration, I returned to my alma mater to pursue a Master of Science in Computing and Information Science that focused on Human-Centered Design and Learning Performance Technology. This academic endeavor provided me with the opportunity to engage in a career at the nexus of Instructional Design and User Experience Design (UX) for an extended period. Still, it wasn’t until I stumbled upon David and Tom Kelley's (IDEO) book, *Creative Confidence: Unleashing the Creative Potential Within Us All*, that I could finally articulate the method I had been using to creatively solve professional and personal challenges: design thinking. This revelation was therapeutic and life-affirming, setting me on a clear path to nurture my creative self-efficacy and igniting my passion for helping others do the same.

Today I collaborate with individuals, Agile teams, and CX-based initiatives to reimagine solutions surrounding people, processes, and technology by framing and focusing on the right

problem to generate the best solution. In a nutshell, I facilitate workshops and coach individuals to become more outcome-driven rather than output-focused, and to think more *systematically*. That's no easy task in a risk-averse industry, and it's even trickier within an organization at the initial stages of digital transformation. I have observed design thinking as a mere requirement to fulfill rather than embracing the underlying behaviors, attitudes, and values. The phenomenon of innovation theater is indeed a reality. As Steve Blank highlights, "organizational redesign, innovation activities, and process reform need to be *part* of an overall plan" (2019, Between a Rock and a Hard Place section). Resistance to change is a natural response when introducing novel concepts to an organization. However, my educational journey in Creativity and Change Leadership at Buffalo State University has given me the creative confidence to challenge the status quo and advocate for more human-centered approaches to organizational transformation. Afterall, recognizing the existence of a problem is the first step toward resolving it. More importantly, engaging with individuals based on their exact needs and circumstances is crucial, regardless of whether they are the target audience or the collaborative partners involved in the design process.

Like CPS, design thinking can help find a balance between being reliable and accurate, exploring new ideas and discovering insights, and using intuition and analytical thinking (Martin, 2009). However, I have not found any resources that cover both the thinking and emotional skills involved in creative problem-solving for design thinking as well as CPS does. This presents an opportunity to merge the most effective aspects of both models, creating a framework that I want to learn from and assist others in comprehending and connecting with more effectively.

SECTION TWO: PERTINENT LITERATURE

A multitude of visual representations for design thinking exists (Forshaw, 2019). My analysis will focus on the model frequently linked to the Hasso Plattner Institute of Design at Stanford, also known as The D. School. Intriguingly, I can no longer locate any textual references to this model on their website (https://dschool.stanford.edu/resources). Nevertheless, the D. School is renowned worldwide for its expertise in applying and teaching design thinking and I leverage this model in my own organization. The five phases of this conceptual model are: *empathize, define, ideate, prototype,* and *test* (Dam, 2023).

As shown in Figure 1, the first stage, *Empathize*, involves understanding and empathizing with users to gain insights into their needs and feelings. The second stage, *Define*, involves synthesizing the information gathered in the empathize phase to define the core problems that must be solved. In the third stage, *Ideate*, participants generate many ideas and select the most promising ones to move forward. The fourth stage, *Prototype*, involves creating physical or digital prototypes that can be tested and evaluated. Finally, in the *Test* phase, prototypes are tested with potential users or stakeholders to gather feedback and refine the solution. Designers can create a final solution that meets users' needs and effectively solves the problem by iterating on the prototype based on feedback.

When delving into the world of CPS, we're tapping into the ingenious framework crafted by Gerard Puccio, Marie Mance, and Mary Murdock, known as the *Creative Problem Solving: the Thinking Skills Model* (Puccio et al., 2012, p. 74). This model encompasses three essential stages: *clarification, transformation,* and *implementation*. Each step involves divergent and convergent processes, such as *exploring the vision, formulating challenges, exploring ideas, formulating solutions, exploring acceptance,* and *formulating a plan*. The "executive step" of

assessing the situation helps to clarify our current thinking and determine the best direction to proceed (Puccio et al., 2010).

Deliberate creativity, whether unleashed through the magic of CPS or the wonders of design thinking, embraces the delightful synergy between the intellectual and the emotional. Although CPS is often perceived as mainly cerebral due to its association with higher-order thinking skills, it's infused with a spectrum of heartfelt abilities. Cognitively, the processes within CPS encompass *diagnostic, visionary, strategic, ideational, evaluative, contextual*, and *tactical thinking* abilities. Meanwhile, the related emotional skills include *mindfulness, dreaming, identifying gaps, playfulness, avoiding premature closure, sensitivity to one's environment,* and *tolerance for risk.* I will take a deeper dive into all of these attributes in my Master's Project.

In developing my framework and narrative, I will draw from various scholarly resources, including books, industry blogs, and academic articles.

Two essential books on Creative Problem Solving (CPS) are *Creativity Rising: Creative Thinking and Creative Problem Solving in the 21st Century* (Puccio et al., 2012), which presents techniques, strategies, and tools to foster creativity and enhance individual and organizational problem-solving capabilities, and C*reative Leadership: Skills That Drive Change* (Puccio et al., 2010), where the authors emphasize the importance of creative problem-solving skills for effective leadership and fostering innovation and adaptability in organizations.

Regarding design thinking, *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation* by Tim Brown (2009) highlights the value of design thinking as a collaborative, human-centered, and innovative approach for problem-solving in organizations, while *Creative Confidence: Unleashing the Creative Potential Within Us All* by

David Kelley and Tom Kelley (2013) focuses on nurturing creative confidence to unlock individuals' potential for innovation. Lewrick, Link, and Leifer's (2018) *The Design Thinking Playbook* provides a comprehensive guide to implementing design thinking in order to foster mindful digital transformation across various aspects of organizations, including teams, products, services, businesses, and ecosystems. *The Designing for Growth Field Book: A Step-by-Step Project Guide* by Liedtka et al. (2019) provides a practical guide for implementing design thinking in projects to foster innovation and growth.

From a business perspective, *Innovation by Design: How Any Organization Can Leverage Design Thinking to Produce Change, Drive New Ideas, and Deliver Meaningful Solution*s by Lockwood and Papke (2018) emphasizes the importance of leveraging design thinking for organizational change, innovation, and problem-solving, and *The Design of Business: Why Design Thinking is the Next Competitive Advantage* by Roger L. Martin (2009) asserts that design thinking is crucial for businesses to gain a competitive edge.

The Designer's Guide to Product Vision by Fish and Kiekbusch (2020) offers strategies and techniques for building strategic influence and crafting products that matter in the rapidly evolving world of technology and design. Similarly, Douglas Ferguson (2019) explores practical strategies for navigating the complex process of transforming ideas into tangible outcomes in his book, *Beyond the Prototype: A roadmap for navigating the fuzzy area between ideas and outcomes*.

Empathy is a central theme throughout my project. *Practical Empathy: For Collaboration and Creativity in Your Work by Young* (2015) highlights the importance of empathy in fostering collaboration and enhancing creativity in the workplace.

SECTION THREE: PROCESS PLAN

In the interest of transparency, I want to share that I am utilizing OpenAI technology ChatGPT Plus (https://openai.com/blog/chatgpt-plus), particularly ChatGPT-4, to enhance my ability to express ideas and establish connections between concepts more effectively as part of my process. Imagine bouncing ideas off a friend and incorporating their insights to ensure a message is clearly understood or working with an editor to enhance wordsmithing—that is how I use this resource. Furthermore, I am fascinated by the potential of generative AI to augment, rather than replace, aspects of creative flow. I named my bot Marvin and they are exceptionally helpful.

Regarding my content, I will set forth on this expedition by undertaking and assessing the subsequent sequence of steps:

1. Delve into a review of scholarly resources and industry articles, and distill the wisdom and insights gleaned from the examined literature.
2. Craft a framework that seamlessly intertwines Creative Problem Solving (CPS) elements with design thinking methodology.
3. Illuminate the intricate thought processes and emotions experienced during a human-centered, creative problem-solving experience.
4. Envision and narrate a compelling story that effectively conveys the essence of the developed framework and its practical applications.
5. Lay a robust foundation, using the framework to propel future endeavors in training, teaching, and writing on the subject.

Figure 1

Project Milestones & Deadlines

Set direction for Master's Project	01/30/2023
Submit first iteration of Concept Paper	02/12/2023
Review feedback and refine sections 1-3	02/15/2023
Submit finalized Concept Paper to instructor for approval	02/19/2023
Finish research and synthesis of reference material	03/05/2023
Continue to refine sections 1-3	03/12/2023
Write 1st iteration of sections 4-6	03/19/2023
Submit final 1-3, develop first iteration 4-6	03/21/2023
Make any necessary revisions to 1-3, continue work on 4-6	04/11/2023
Submit sections 4-6 to instructor for review	04/23/2023
Complete paper and submit entire document to APA editor for review	04/24/2023
Make any necessary revisions to full document	04/30/2023
Submit completed document to instructor for final review	05/01/2023
Submit completed and approved Master's project to Digital Commons	**05/08/2023**
Design 7 minute formal presentation	05/09/2023
Deliver 7 minute formal presentation	05/17/2023
Completion of Spring semester	05/19/2023
Graduation from program	05/20/2023

SECTION FOUR: OUTCOMES

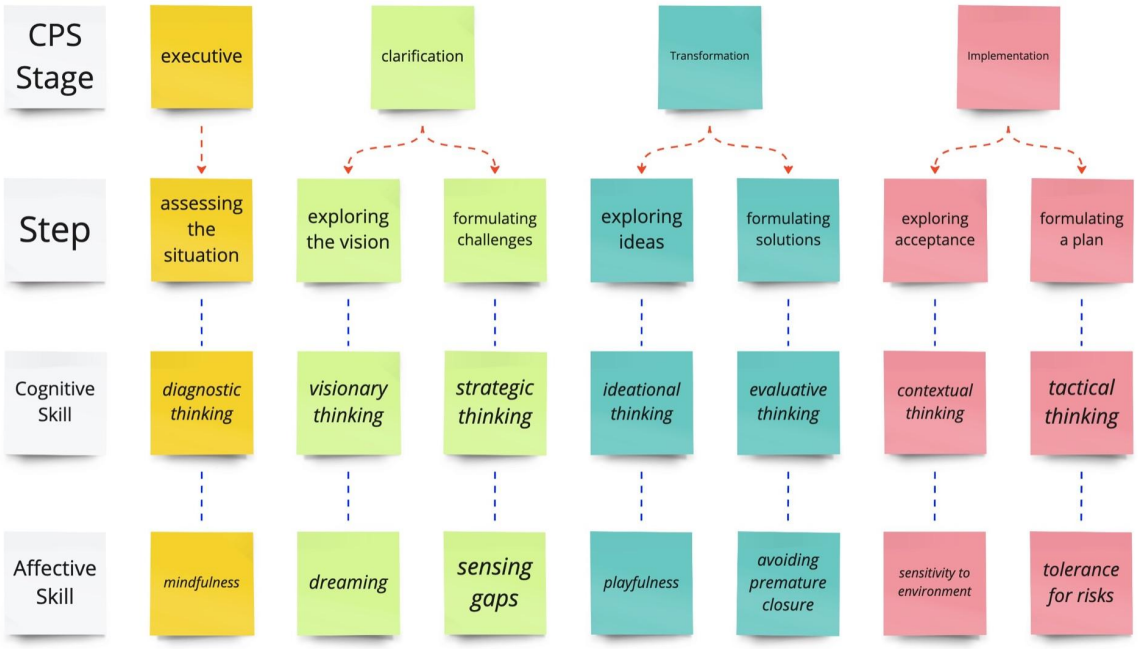
One of my favorite resources from my learning experience in the Creativity and Change Leadership Master of Science program is the book, *Facilitation: A door to creative leadership*. In this guide, Miller et al. (2011b) distinguish between two key classifications, process and content, which comprise the whole of Creative Problem Solving. They describe the process as "how to solve the problem" and the content as "what is the problem" (Miller et al., 2011b, p. F-8). This differentiation was a significant revelation as I grappled with balancing the "what" and "how" in design thinking. As a design thinking facilitator, I have often felt inclined to provide insights or solutions to groups working on customer problems or new product development using the method to incorporate more human-centered design practices. However, this approach ultimately undermines the learning experience for the participants.

Recognizing the distinction between process and content, and understanding that *my part* is to manage the process rather than the content, has been transformative in reducing my cognitive load and promoting greater ownership and accountability among participants responsible for the content. Nonetheless, I still sought ways to enhance my understanding of our position within the process, identify activities that would yield optimal outcomes, and determine the best way to move forward. As I moved through the Creativity and Change Leadership program and reflected on the new things I've learned in addition to what I have experienced. In a striking twist of irony, I found that despite my extensive background as a design thinking facilitator emphasizing empathy, creativity, and human-centeredness, I had not fully comprehended the critical role emotions and cognition played in optimally guiding and navigating the process.

Introducing *CPS: the Thinking Skills Model*, which I consider the crucial missing component in my professional journey before joining the Master of Science program (see Figure 2). I believe this model is the essential connection for those struggling to implement and teach design thinking effectively. This paper aims to reconfigure the thought processes fundamental to design thinking by incorporating the cognitive "thinking" and affective "feeling" skills of Creative Problem Solving (CPS). By emphasizing critical elements of the model and advocating a more navigable, iterative flow, this approach challenges the linear, step-by-step progression often depicted visually. The integration deepens my understanding of the underlying mechanics. It fosters a language accessible to everyone, regardless of the process used to advance from opportunity to the adoption of a creative change.

Figure 2

Representation of the Core Elements of CPS: The Thinking Skills Model



Note. Visual representation of *CPS: the Thinking Skills Model* created from elements of CPS: the Thinking Skills Model adapted from Puccio, G. J., Mance, M., & Murdock, M. C. (2010). *Creative Leadership: Skills That Drive Change*. SAGE Publications.

CPS: What Is It?

Creative Problem Solving (CPS), introduced in the mid-1950s by a professionally diverse group of individuals, including Alex Osborn and Dr. Sidney J. Parnes, has evolved over the years through dedicated study and research by individuals such as Dr. Ruth Noller, Morris Stein, and E. Paul Torrance (Miller et al., 2011). Boasting an extensive and storied past, CPS is one of the most extensively researched and commonly employed creativity models (G. J. Puccio et al., 2012). Today, the preservation of CPS is possible through the Center for Applied Imagination

(https://creativity.buffalostate.edu/) in Buffalo, New York, and the Creative Education Foundation (https://www.creativeeducationfoundation.org/) in Amherst, Massachusetts.

Nonetheless, throughout its history, CPS has undergone various modifications and refinements (G. J. Puccio et al., 2012). *Creative Problem Solving: the Thinking Skills Model* is one of these iterations. Devised by Gerard Puccio, Marie Mance, and Mary Murdock, this version of CPS is the first to encompass both the cognitive and emotional aspects experienced by an individual during creative problem-solving and the essence of the thinking process itself (G. J. Puccio et al., 2012).

Design thinking's blend of creativity and practicality has made it a favored methodology for addressing seemingly insurmountable challenges that traditional business tools and processes struggle to solve (Dell'Era et al., 2020). Therefore, *creativity*, encompassing the production of change, arises from the interplay between cognitive processes and the emotions that influence thinking, positively and negatively, engaging both the head and the heart (G. J. Puccio et al., 2012). But what is meant by *creativity*? In the book, *Create in a Flash*, Roger Firestien (2020) uses a definition of creativity inspired by Dr. Morris I. Stein, "the production of something that is novel and useful" (p.15). In *Creativity Unbound*, Miller et al. (2011a) define creativity as "novelty that's useful" (p. 14), with novelty described as "newness, originality, a fresh approach" and usefulness as something that "serves a purpose" and "has value." I want to expand on those to include, *to meet a human need*. I will refer to these thinking and feeling skills within my conceptual model as *cerebral* and *heartfelt to facilitate the production of something novel and beneficial for humans.*

Thinking About Thinking

More formally defined, Creative Problem Solving (CPS) is "a comprehensive cognitive and affective system built on our natural creative processes that deliberately ignites creative thinking and, as a result, generates creative solutions and change" (G. J. Puccio et al., 2010, p. 43). In the book, *Think Better: An Innovator's Guide to Productive Thinking,* Hurson (2010) argues that not one of us is born knowing how to think; it's a skill we acquire, and while some may encounter mentors and situations that foster practical thinking, others may not, yet everyone has the potential to improve their thinking abilities. Although we all possess innate creative inclinations, genuine creative accomplishments demand years of life experience and can be further developed through education and training (G. J. Puccio et al., 2012). American Designer Jerry Hirschberg said, "creativity is not an escape from disciplined thinking. It is an escape with disciplined thinking" (Hurson, 2010, p. 86). In other words, creativity doesn't involve evading structured thought; instead, it thrives alongside disciplined thinking.

Disciplined thinking relies on our metacognitive abilities, which involve monitoring and regulating cognitive processes and engaging in self-reflection on our thoughts. This self-awareness is critical to effective problem-solving (Puccio et al., 2010). In C*PS: the Thinking Skills Model*, the executive phase of *assessing the situation* involves gathering and applying data to decision-making processes throughout the design journey. The outcome of this stage is to effectively describe and identify relevant data, assess a situation thoroughly, determine the nature of a problem, and decide on appropriate next steps, all while being mindful of thoughts, sensations, and feelings related to the present situation (Puccio et al., 2010). This step serves as an overarching analytical tool, aiding facilitators and design thinkers in better interpreting

collected information, understanding their position in the process, and enabling the transition from abstract ideas to concrete actions.

Puccio et al. (2012) highlight the importance of flexible thinking when addressing complex issues or wicked problems. They contend that rigid, linear approaches may fail in such situations and that effectively navigating complex cognitive processes is crucial for promoting creative growth and responses. My apprehension regarding numerous visual models representing design thinking stems from their oversimplified depictions. These minimal portrayals can inadvertently lead to incorrect assumptions about how the process should function. Tim Brown, a prominent figure in design thinking, acknowledges that it was never meant to be a rigid methodology with predetermined stages and assured results (2019). Why do so many visual depictions of design thinking appear overly simplified? In a recent LinkedIn post, Jared Spool (2023) argued, “I'm sorry, but ‘empathize’ should never be a step in a process.” I concur with this viewpoint; while linear visuals may portray empathy as a single step, it is essential to embed it throughout the journey. Presenting empathy only at the beginning could imply that human involvement is limited to the initial stage when, in fact, it should be a continuous presence throughout the entire process.

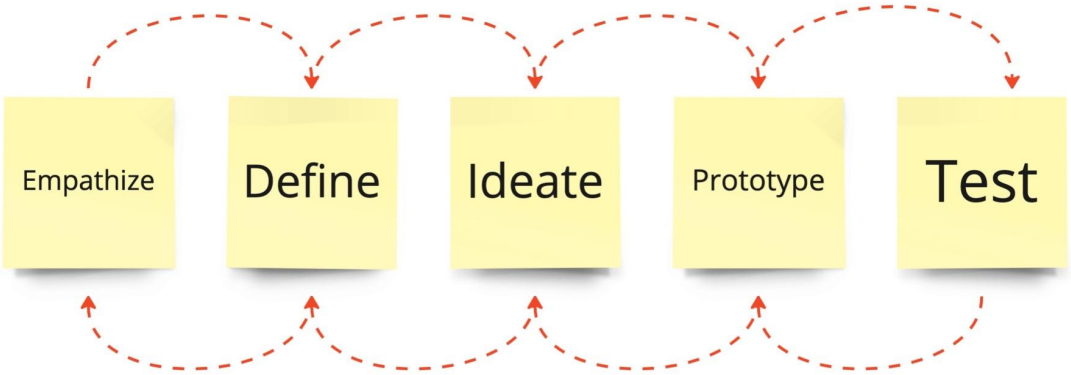
Liedtka (2018) highlights that managers on innovation teams often lack design expertise and are not accustomed to human-centered behaviors, such as engaging in face-to-face research with customers, synthesizing insights, co-creating with stakeholders, and designing and executing experiments. She emphasizes that the presence of structure and linearity helps these managers adapt to and adopt these new behaviors. This further underscores the need to move away from rigid visual constructs and focus more on our thoughts and feelings. We can better comprehend our current position within the process and determine the appropriate next steps,

minus the box-checking. After all, creativity-relevant skills encompass the cognitive styles, work styles, and personality traits that impact an individual's approach to problem-solving tasks (Wylant, 2008).

As mentioned in Section One, this paper will be pulling on design thinking as a five-phase model: *empathize, define, ideate, prototype,* and *test*, which I believe is one of the more commonly utilized visual depictions (see Figure 3). My conceptual framework resonates with Christina Wodtke's (2019) approach in a Twitter discussion, where she enriched the original D.School visual model by incorporating additional steps, including context, critique, elaboration, and systematization. In her depiction, these steps are represented by the D. School hexagons, emphasizing the loops or the importance of iterations. Staying in the design loop is essential until the development of a valuable product, as the iterative process helps identify knowledge gaps, necessitating a return to earlier stages for more profound understanding (Wodtke, 2020). Based on Wodtke's (2020) thorough discussion of her model in the blog post, *Design's Unsexy Middle Bits*, I believe incorporating more of *CPS: the Thinking Skill Model* structure into design thinking can address various barriers to understanding and implementation effectively.

Figure 3

The Five Phases of Design Thinking



Note. Visual representation of design thinking created from Dam, R. F. (n.d.). The 5 Stages in the Design Thinking Process. *The Interaction Design Foundation*. Retrieved from https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process

In my conceptual model, I will begin by examining the higher levels of *CPS: the Thinking Skill Model* of *clarification, transformation*, and *implementation*, and outlining their similarities to the five phases of design thinking. I will then adjust the five-phased D.School design thinking approach to synchronize with the CPS model. A crucial modification involves repositioning *empathy* from a distinct phase (often inaccurately depicted as the first step of a process) to the *executive* stage of CPS. Subsequently, I will align all cognitive and thinking skills of CPS with the adjusted design thinking phases, emphasizing how this improved understanding facilitates a process that yields novel and beneficial outcomes to address human needs. While testing this revised framework is beyond the scope of this paper, conceptually reimagining it in this manner has already proven advantageous for me as a facilitator in both CPS and design thinking.

Melding the Models

Each phase of clarification, transformation, and implementation in CPS alternates between exploration, a more abstract step, and formulation, a more focused and concrete action (Puccio et al., 2012). Puccio et al. (2012) argue that these three conceptual stages represent individuals' natural creative process when facing challenges or opportunities. Furthermore, each phase includes specific activities that facilitate divergent and convergent thinking and the power of inquiry for effective framing.

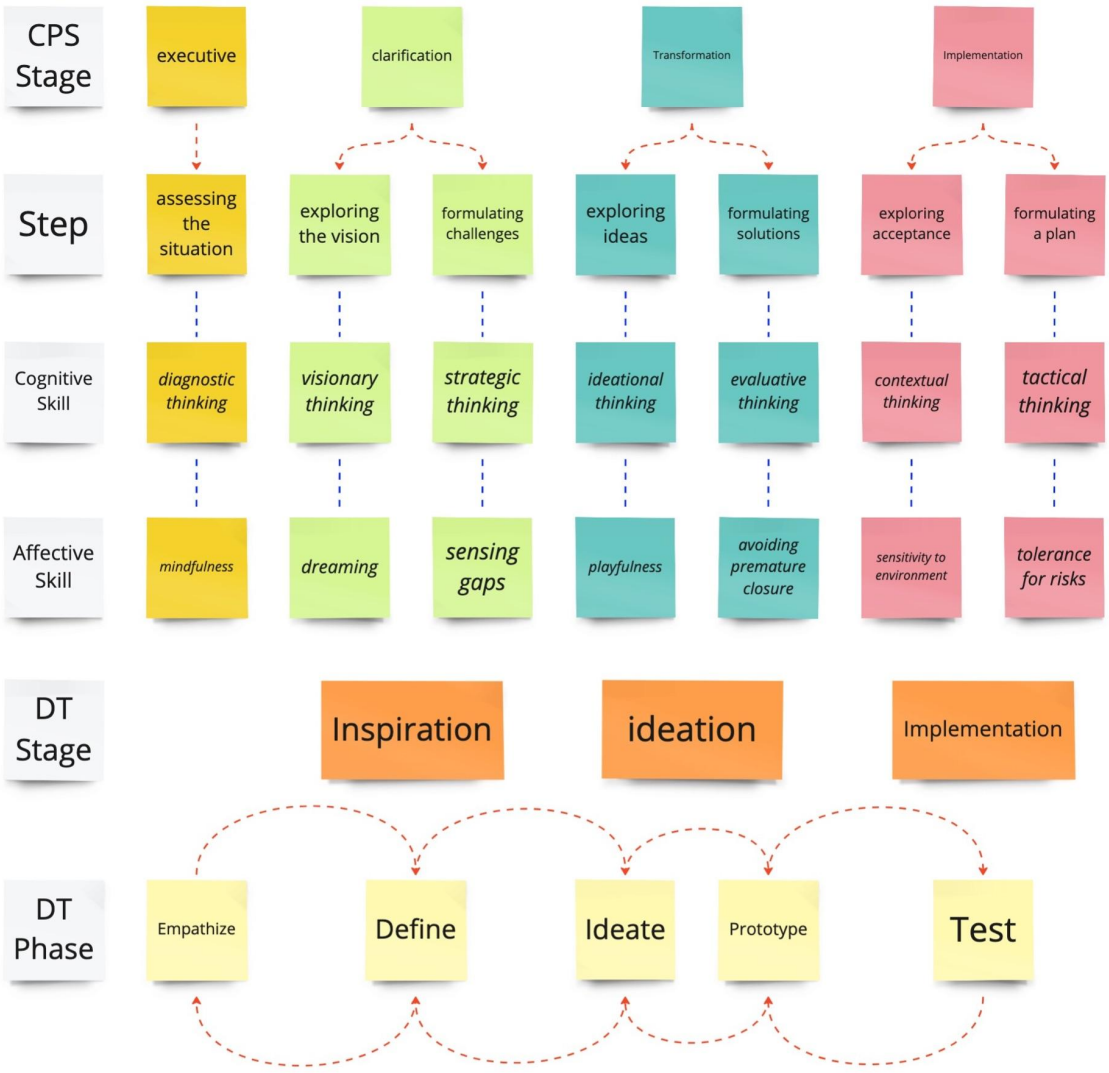
Tim Brown (2019) suggests we understand the innovation continuum as a system of intersecting spaces rather than a linear sequence of steps. These interconnected spaces, divided into the five stages of empathize, define, ideate, prototype, and test, encompass inspiration (problem or opportunity), ideation (idea generation, development, and testing), and implementation (from solution to market). Throughout the process, projects may cycle back and forth between these spaces in response to emerging insights and exploring new directions.

As the higher-level phases of Creative Problem Solving (CPS) also consist of three components—clarification, transformation, and implementation—the integration of the thinking and feeling skills appears to be a natural fit (see Figure 4). The clarification stage in *CPS: the Thinking Skills Model* starts with examining a wide-ranging vision and concludes with pinpointing and addressing specific challenges to achieve it (Puccio et al., 2012), akin to the inspiration phase mentioned earlier. The transformation stage begins with a comprehensive search for potential ideas to address these challenges and culminates in creating viable solutions (Puccio et al., 2012), resembling the ideation phase in the design thinking context. Lastly, the implementation stage commences with a thorough exploration of the context that may either support or impede the execution of these solutions and concludes with a well-defined action plan

(Puccio et al., 2012), which is also analogous to the implementation phase of design thinking, albeit through different methods.

Figure 4

A Revised Conceptual Model



Note. Visual conceptualization created from elements of Dam, R. F. (n.d.). The 5 Stages in the Design Thinking Process. *The Interaction Design Foundation*. Retrieved from https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process; elements of CPS: the Thinking Skills Model adapted from Puccio, G. J., Mance, M., & Murdock, M. C. (2010). *Creative Leadership: Skills That Drive Change*. SAGE Publications; and Brown, T. (2019). *Change by design: How design thinking transforms organizations and inspires innovation* (revised & updated edition). Harper Business.

Where Do We Begin? The Executive Step

Assessing the situation is "the executive step" that helps individuals comprehend their current position in their thinking process and determine the most appropriate next steps (Puccio et al., 2010). Considered an "overarching skill within the CPS process," assessing the situation is a crucial meta-step (Puccio et al., 2012, p. 125). This skill entails systematically evaluating the context, collecting pertinent information, and pinpointing the main challenges and opportunities within a specific problem space. By possessing this skill, individuals can gain a profound understanding of the issue at hand, establishing a solid foundation for effective and targeted problem-solving strategies.

The Cerebral and Heartfelt: Diagnostic Thinking and Mindfulness

Diagnostic thinking is a cognitive skill that involves meticulously examining a situation, defining the nature of a problem, and identifying the appropriate steps to tackle it (Puccio et al., 2012). We use diagnostic thinking throughout the creative problem-solving process to thoroughly assess each scenario. As we gather data, we ask open-ended questions for more context and stories, helping us verify our assumptions and potential biases and discern patterns for optimal understanding (Puccio et al., 2012). Essentially, we diverge (expanding the scope of information) for sensemaking. We contemplate the suitability of a creative problem-solving approach, our

standing based on available data, and the tools and methods to aid progress and informed decision-making. Self-awareness and situational awareness are vital in this context.

Mindfulness is the emotional skill associated with Diagnostic Thinking, which emphasizes paying close attention to thoughts, emotions, and physical sensations related to the current circumstance (Puccio et al., 2010). In organizational settings, mindfulness relates to various positive performance, relationships, and well-being outcomes. However, its benefits go beyond our worldview, fostering collaboration, practical learning, systematic thinking, and efforts to alleviate others' suffering. Cultivating empathy is necessary for this purpose.

Assessing Situations Through Empathy

Design thinking sets itself apart from Creative Problem Solving by emphasizing empathy. Lewrick et al. (2018) define empathy as "the ability to perceive other people's emotional sensitivities and respond to them adequately" (p. 76). In her book *Practical Empathy*, Indi Young emphasizes that "empathy is a noun—a thing," representing an understanding one develops about another person (Young, 2015, p. 18). She explains that empathy involves intentionally seeking to comprehend someone else's cognitive and emotional states, cultivated through dedicating time to uncover the underlying thoughts and responses that drive another person (Young, 2015). In their book C*reative Confidence*, David and Tom Kelley (2013) underscore that innovation opportunities arise when empathy for the target audience initiates creative problem-solving.

I would suggest that this connection underlines the significance of empathy and self-awareness in both design thinking and Creative Problem Solving. *CPS: the Thinking Skills Model* encourages empathy towards ourselves and fosters self-compassion. By emphasizing empathy as a foundational mindset in design thinking and using it to enhance decision-making,

similar to the executive function in CPS, we can ensure meaningful, impactful, and successful designs that involve users throughout the entire experience by understanding the underlying cognitive and emotional states during CPS engagement.

Kelley and Kelley (2013) emphasize human-centered innovation, asserting that deep empathy for people can inspire and enhance observations. The primary goal is to understand why people behave in specific ways to anticipate future actions. Fish and Kiekbusch (2020) argue that practicing empathy is a method for assessing emotional intelligence, which involves identifying, understanding, and managing one's and other's emotions. They further explain that compassionate empathy, combines cognitive and emotional aspects while inspiring action to assist and drive meaningful and impactful change in the world.

Empathy plays a vital role in problem-solving and a human-centered design approach, as it enables design thinkers to put their own preconceptions aside and obtain genuine understanding of users and their requirements (Dam, 2023). This is achieved through various human-centered methods and research techniques, including direct observation, contextual interviews, persona creation, empathy mapping, and diary studies, among others. Significant data will be collected, and considering empathy as a phase initiates the process of gaining the deepest possible understanding of users, their needs, and the underlying issues related to the problem to be solved, or product or service to be developed (Dam, 2023).

The Clarification Stage (CPS) and Define (DT)

By aligning the Define phase of design thinking with the clarification stage of *CPS: the Thinking Skills Model*, it becomes evident that incorporating both thinking and feeling components can promote effective problem framing, project scoping, and better anticipation of potential barriers. In the Define stage, the challenge formation occurs after thoroughly examining

user needs and desires. Focusing on understanding users' needs and drawing insights from real-world experiences makes design thinking more approachable and tangible instead of relying solely on abstract notions or theoretical frameworks. As a result, individuals and teams can more easily grasp design thinking principles and apply them effectively to tackle complex challenges. The design process inherently confronts ambiguity, a feature often associated with wicked problems, requiring design thinkers to accept this uncertainty throughout their iterative cycles of experimentation and refinement (Dell'Era et al., 2020). Like CPS, problem framing is essential in design thinking, as it lays the foundation for subsequent steps such as ideation, prototyping, and testing, ultimately resulting in more successful outcomes.

Brought to life are the insights only after analyzing all observations gathered during the research to identify patterns and core issues. The synthesized data and developed insights are then translated into a human-centered, actionable, focused problem statement to guide imaginative and problem-solving efforts. Ensuring the framing of the problem statement from the users' perspective guarantees human-centeredness (Dam, 2023).

Puccio et al. (2012) state that the Clarification Stage in CPS involves determining one's desired direction and identifying obstacles. They suggest referring to the "exploring the vision" phase if the objective is to establish the desired outcome or target. On the other hand, if the goal is to identify the barriers to achieving the desired result, they recommend the "formulating challenges" phase.

Taking Action: Exploring the Vision in Design Thinking

Puccio et al. (2010) emphasize adopting a visionary outlook in the Creative Problem Solving process, as it fosters forward-thinking, envisions the goal, and outlines the steps to

achieve it. They argue that clarifying one's objectives creates a unified focus, allowing for the effective channeling of creative energy.

Fish and Kiekbusch (2020) state that this phase forms the future iteration of a product or service, taking into account the complex relationships within the strategy, such as the where, who, what, when, and why, by describing an ideal experience and highlighting the offering's key features and benefits through a groundbreaking conceptual solution. They further assert that a product vision is vital in design thinking because it offers a clear direction and acts as the central anchor for the product strategy, propelling it into action. Puccio et al. (2010) associate keywords like "picture, dream, look at, forecast, contemplate, see, speculate, ponder, wonder about" with exploring the vision (p. 131).

The Cerebral and Heartfelt: Visionary Thinking and Dreaming

In their book, Innovation by Design, Lockwood and Papke (2019) assert that "the collective imagination is humankind's greatest genius" (p. 9). Similarly, Puccio et al. (2010) stress the importance of visualizing desires and aspirations as achievable, which is essential for nurturing visionary thinking abilities. By engaging in the feeling skill of dreaming, individuals can emotionally connect with their goals and envision their attainment, which in turn enhances their belief in their ability to achieve them. Essentially, dreaming plays a crucial role in fostering visionary thinking.

By developing the mindset required to pursue and achieve their objectives, individuals become better equipped to overcome challenges and obstacles encountered during the creative problem-solving process. As a result, the ability to emotionally connect with and visualize one's aspirations is a critical skill that strengthens individuals' belief in their potential to achieve their

goals. Moreover, it fosters the visionary thinking necessary for successful outcomes in both CPS and DT methodologies.

Taking Action: Formulating Challenges in Design Thinking

Puccio et al. (2010) define challenges as hurdles that hinder the achievement of desired objectives, such as solving a dilemma or seizing an opportunity. Identifying challenges entails addressing and pinpointing the gaps or obstacles to reach the goals. This process demands a comprehensive understanding of the current situation and a lucid vision of the desired outcome. By evaluating the discrepancies between the present state and the envisioned future, designers can effectively recognize the barriers to overcome. This vital step enables the development of targeted strategies and solutions to bridge these gaps, ultimately achieving objectives.

Design thinking heavily depends on acquiring an in-depth understanding of the problem before generating solutions (Dell'Era et al., 2020). To efficiently address a problem, design thinkers need to embrace a holistic approach, which includes critically analyzing the initial problem statement and redefining it if required. A well-defined problem statement concentrates on the most crucial aspects of the challenge, enabling designers to create targeted and efficient solutions. Keywords associated with formulating challenges are "clarify, untangle, explicate, define, decipher, clear up, uncover, discern why" (Puccio et al., 2010, p. 131).

The Cerebral and Heartfelt: Strategic Thinking and Sensing Gaps

Individuals and organizations can adeptly manage complexities, tackle challenges, and pursue their intended goals by cultivating a strategic mindset and persistently tracking progress. Strategic thinking is an all-encompassing approach that emphasizes identifying critical challenges and discovering routes to reach a desired future (Puccio et al., 2010). This method entails examining the present situation and clarifying objectives. Puccio et al. (2010) assert that

individuals gain a heightened understanding of the differences between the current state and the desired or required outcomes by detecting gaps. This approach ultimately promotes conscious awareness of discrepancies and encourages well-informed decision-making.

The Transformation Stage (CPS) and Ideation & Prototyping (DT)

Ideation in design thinking aligns with the transformation stage in *CPS: the Thinking Skills Model*, as it too involves transforming insights and ideas into tangible solutions. Like CPS, in design thinking, this stage emphasizes the various methods and approaches that enhance creativity (Lewrick et al., 2018). This phase and stage allow design thinking to engage in imagination by generating a wide range of ideas to tackle the well-defined human-centered problem statement to weave in the thread of empathy continuously.

Puccio et al. (2012) assert that individuals must modify their current situation by identifying potential ideas and developing them into viable solutions. They suggest that individuals pursue the exploring ideas step if a specific challenge is recognized, but the approach to resolve it remains unclear. Conversely, if ideas must be refined into practical solutions to tackle a challenge, the formulation solutions phase should be the next step. I appreciate these two distinctions, as I have observed (and caught myself) in the habit of using both "idea" and "solution" interchangeably. For clarity, an "idea" is a thought or suggestion generated during the creative process, whereas a "solution" is a well-formulated plan or method for addressing a problem. Ideas result from divergence, where there's an exploration of multiple possibilities. In contrast, a solution is an act of convergence, choosing a specific action to resolve the issue.

The generation of ideas is possible through a range of divergent exercises such as brainstorming, Stick 'em Up Brainstorming, Brainwriting, Forced Connections, Word Dance, SCAMPER, The Idea Box, Visual Connections, "Why? What's Stopping You?" and Excursions

(Miller et al., 2011a). Solution formulation narrows options through convergent activities such as Highlighting, Restating Clusters, Card Sort, Evaluation Matrix, and Targeting (Miller et al., 2011a). The iterative process of testing and iteration enables the team to refine the solution until it effectively addresses the problem and meets users' needs.

Liedtka (2018) explains that neuroscience studies suggest that enabling individuals to "pre-experience" or, in other words, to envision something new with remarkable clarity, leads to more precise evaluations of the innovation's worth. In design thinking, making ideas tangible and solutions testable is achieved through prototyping. Prototypes are low-cost, simplified versions of the product (or specific features within the product) to explore the main solutions identified during the ideation phase (Dam, 2023). Prototypes can be shared and evaluated with people to test for desirability and usability. Usability is a measure of the ease with which user interfaces can be utilized, and it also pertains to the techniques employed to enhance user-friendliness throughout the design process (Usability 101: Introduction to Usability, n.d.).

Design thinking focuses on raising several good questions rather than finding the correct answers (Wylant, 2008). By the conclusion of the Prototype stage, a design thinker will gain a deeper understanding of the product's constraints and challenges, as well as clearer insights into how actual users would act, think, and feel when engaging with the final product (Dam, 2023). Design thinkers, who have been prototyping and making adjustments since the beginning, exemplify the IDEO (https://cantwait.ideo.com/) adage, "Fail early to succeed sooner" (Brown, 2019, p. 22) a testament to the true nonlinearity of the phases.

Taking Action: Exploring Ideas

According to Puccio et al. (2010), the primary objective when exploring ideas is to generate innovative and original concepts that successfully address significant challenges. Encouraging collaboration is vital, as bringing together individuals with different backgrounds, skills, and expertise can result in unique and potentially groundbreaking solutions. Cultivating a culture that embraces experimentation, risk-taking, and learning from failures is also crucial, as these elements can foster the development of new ideas and contribute to the growth of creative problem-solving skills.

Continuously refining and iterating on ideas based on feedback and new insights is critical to promoting a flexible and adaptive approach to addressing challenges. Brainstorming activities involve both divergent and convergent thinking. Divergent thinking focuses on generating numerous ideas without judgment and welcoming various perspectives. Convergent thinking comes into play after the divergent phase, where statements are critically evaluated and prioritized based on their feasibility, desirability, and viability with the challenges at hand. By integrating these components into the ideation process, individuals and organizations can enhance their ability to generate innovative solutions that effectively tackle fundamental challenges, ultimately driving change and fostering progress (Puccio et al., 2010). Keywords associated with exploring ideas include “come up with, invent, break through, originate, innovate, hatch, fashion, think up, find a way, make up, design a way” (Puccio et al., 2010, p. 131).

The Cerebral and Heartfelt: Ideational Thinking and Playfulness

"Ideating involves sharing insights with the team, interpreting a vast amount of data, and identifying opportunities for new solutions" (Dell'Era et al., 2020, p. 330). Ideational thinking generates mental imagery and ideas that tackle significant challenges (Puccio et al., 2010). To surpass mere imitation and incremental advancements, a higher degree of creativity is essential when developing new ideas (Wylant, 2008, p. 10). Playfulness is the emotional skill linked to ideational thinking, which involves uninhibited exploration and experimentation of ideas (Puccio et al., 2010). Liedtka (2018) asserts that real-world experiments play a crucial role in evaluating new ideas and pinpointing necessary adjustments for practical implementation—and these experiments can help alleviate the common apprehension of change experienced by employees and customers. This connection between experimentation and the element of play can make the process more engaging and enjoyable.

Taking Action: Formulating Solutions

Formulating solutions involves turning ideas into practical, actionable resolutions (Puccio et al., 2010). By transforming ideas into clear solutions, stakeholders can evaluate their feasibility, desirability, and viability, leading to informed decision-making and successful implementation. Establishing measurable objectives through formulating solutions enables progress tracking and evaluation of problem-solving efforts, allowing for a more efficient allocation of resources.

Prototyping allows for the quick creation of a mock-up of a product or service for use in simulated discussions to view the problem from different angles, even when the problem is not yet fully defined (Dell'Era et al., 2020). Keywords associated with formulating solutions include "developing, elaborating, expanding, evaluating, refining, and building on the ideas" (Puccio et al., 2010, p. 131).

The Cerebral and Heartfelt: Evaluative Thinking and Avoiding Premature Closure

According to Puccio et al. (2010), evaluative thinking involves assessing the validity and quality of ideas to create practical and effective solutions, helping to identify the most promising solutions and saving time and resources. Prioritizing practical and impactful solutions enhances the decision-making process and increases the likelihood of successfully addressing challenges and achieving desired outcomes. Additionally, avoiding premature closure, an emotional skill described by Puccio et al. (2010), emphasizes the importance of thoroughly exploring various ideas and solutions to prevent the selection of suboptimal options by resisting the impulse to reach a conclusion or decision hastily.

The Implementation Stage (CPS) and Testing (DT)

Design thinkers rigorously test the final product using the best solutions from the Prototype phase, the last stage in the D. School model. However, in the iterative design thinking process, the results often lead to redefining additional problems, encouraging continuous improvement through revisiting previous stages, and making adjustments based on a deeper understanding of the product and its users (Dam, 2023).

Puccio et al. (2012) state that the final step in CPS involves creating an action plan to implement the developed solutions effectively. Adoption is the goal! Consider the exploring acceptance stage if the solutions require environmental support. Alternatively, if the necessary steps and sequence for successful implementation are unclear, formulating a plan phase should be the next step. Both of these steps are applicable in design thinking to evaluate the solution's performance, gather user feedback, and identify areas for improvement, fostering a continuous cycle of learning and enhancement.

Taking Action: Exploring Acceptance in Design Thinking

It is essential to address potential barriers and foster positive reception of ideas or solutions to increase the likelihood of achieving successful objectives (Puccio et al., 2010). In design thinking, the acceptance phase of CPS is critical for ensuring that the proposed solutions are well-received by stakeholders, including end-users, team members, and decision-makers. This phase involves clearly articulating the value and benefits of the resolution, engaging with stakeholders to gain their support, gathering user feedback, and continuous iteration and refinement based on stakeholder feedback and real-world performance, ultimately leading to more effective outcomes and increased chances of success (Dell'Era et al., 2020; Puccio et al., 2010). Keywords associated with exploring acceptance include "sell, convince, market, promote,

leverage, influence, persuade, pitch, position, introduce, advocate, popularize, recommend" (Puccio et al., 2010, p. 131).

The Cerebral and Heartfelt: Contextual Thinking and Sensitivity to Environment

Puccio et al. (2010) emphasize the importance of contextual thinking, which involves understanding the various interconnected factors and situations that can either facilitate or hinder success. Affective skill environmental sensitivity highlights the significance of awareness of one's physical and psychological surroundings (Puccio et al., 2010). In design thinking, this skill is essential for promoting adaptability and responsiveness to diverse situations and contexts. By being attuned to their surroundings, design thinkers can better understand user needs, identify potential barriers to adoption, and refine their solutions to align better with the unique characteristics of different environments.

Taking Action: Formulating a Plan in Design Thinking

The final step in the Creative Problem Solving approach is to develop an implementation plan that outlines the necessary actions to implement the solution effectively (Puccio et al., 2010). A practical implementation plan is crucial for successfully executing the proposed solution and realizing the intended impact and desired outcomes. In design thinking, creating an implementation plan involves establishing clear goals, defining necessary tasks and resources, developing a timeline with milestones and deadlines, assigning responsibilities to team members, and defining performance metrics for ongoing evaluation and improvement. Keywords associated with this step include "execute, implement, orchestrate, devise, organize, rollout, act, and carry out" (Puccio et al., 2010, p. 131).

The Cerebral and Heartfelt: Tactical Thinking and Risk Tolerance

Puccio et al. (2010) define tactical thinking as the ability to create a plan with specific, measurable steps and methods for evaluating its effectiveness to achieve a desired outcome. This skill is vital in design thinking because it promotes a structured and goal-oriented approach to problem-solving, allowing teams to track progress and optimize their solutions. Developing a risk tolerance is also crucial in design thinking, as it will enable individuals and teams to remain resilient and adaptable in the face of uncertainty and potential failure. Embracing a risk-taking mindset fosters a culture of innovation, experimentation, and continuous improvement, ultimately leading to more successful outcomes.

SECTION FIVE: KEY LEARNINGS

The Content

In my Master's Project, *Connecting the Cerebral and Heartfelt: Integrating Creative Problem Solving and Design Thinking*, I investigate the potential advantages of incorporating the thinking and feeling skills from the *CPS: the Thinking Skills Model* into the design thinking process. Through an in-depth analysis of various materials, visual conceptualizations, and synthesis, I have enhanced my understanding of the CPS methodology, improving my application of design thinking strategies. Consequently, I can encourage others to view these methodologies as guiding conceptual frameworks rather than strict, step-by-step procedures. This personal growth has better equipped me to support Designers and non-designers in navigating ambiguous situations and empowering them to make confident decisions about their next course of action.

Miller et al. (2011a) argue that the effectiveness of CPS lies in its depiction of a natural problem-solving process that people already utilize. Since problem-solving is a universal skill, most individuals follow a similar approach to reach solutions. By explicitly outlining the CPS process, people can better comprehend their position in the process and their direction, resulting in increased clarity and efficiency in problem-solving. In the context of design thinking, Carlgren et al. (2016) note that "some skills related to intuition were particularly important and were only developed through experience; knowing when you have probed deep enough in qualitative interviews, knowing when insights are good enough—in short, knowing when to stop iterating" (p. 355). By dissecting the CPS model, including its cognitive and emotional aspects, I have transformed the vague notion of "intuition" from an abstract "hunch" into a more tangible and

actionable concept. However, as I discovered through this experience, some ideas don't always fit neatly into predetermined categories, and that's perfectly acceptable.

Empathy serves as a crucial element in my revised conceptual model, guiding the design thinking process to be more human-centered and responsive to the emotional and psychological aspects of problem-solving. Introducing clarification, transformation, and implementation stages to design thinking might ensure a more comprehensive exploration of the vision, challenges, ideas, and solutions. The instruction of this blended CPS and DT conceptual model could enable practitioners to delve deeper into problems, resulting in a more sustainable and impactful change.

However, by eliminating empathy as a distinct phase and incorporating it as a more overarching function, I am concerned that downplaying empathy's role may inadvertently underrepresented the essential user research vital for uncovering opportunities in design thinking. Indi Young emphasizes that taking action without fully understanding the affected individuals can lead to chaos inside and outside organizations (Young, 2015). This premature action occurs due to the confusion between empathy and empathizing, the business pressure to be lean, fast, agile, and minimally viable, and the tendency to believe in our assumptions and conjectures about others (Young, 2015). Indeed, this topic deserves another Master's Project.

Furthermore, I see this as version 1 of the framework, as the D.School five-phased model and *CPS: the Thinking Skills Model* didn't sync as seamlessly as I had hoped. The next iteration would include a better breakdown of design thinking, such as the model in *The Design Thinking Playbook* by Lewrick et al. (2018), which breaks out the phases into *understand, observe, define point of view, ideate, prototype, test,* and *reflect* (p. 43).

The addition of design thinking phases would likely lend itself well to more on other thinking skills, such as analytical and critical, in addition to a more thoughtful exploration of reasoning types like abductive, deductive, and inductive.

In conclusion, this is a good starting point for incorporating more education around cognitive and emotional skills in design thinking. We might establish a more holistic, empathetic, and practical problem-solving process, better equipped to handle the intricacies and subtleties of wicked problems and, ultimately, foster more successful products or creative change adoption. I will use the framework conceptualized from this exploration to assist both Designers and non-designers in navigating unclear situations, enabling them to determine their next steps confidently and serving as an antidote to the inevitable analysis paralysis. As I continue to refine this integrated approach, I hope to contribute to the expansion of more effective and human-centered problem-solving methodologies that empower individuals and organizations to create meaningful and lasting creative change.

The Process

As I mentioned in Section Three: Process Plan, I employed Chat-GPT (version 4) throughout my Master's Project to generate ideas, refine concepts, and enhance the clarity and scholarly tone of my writing, which can often be a tedious process. This AI integration added a meta layer to my learning experience.

In an interview with Kevin Kelly, a renowned editor, author, and futurist, he discussed the role of AI in our lives as partners, assistants, and pets rather than as gods (Smith, 2023). Kelly compared the current generation of AI agents, such as ChatGPT and Dalle, to universal interns that millions of people utilize for tasks like drafting documents, brainstorming ideas, and summarizing research. He stressed the importance of verifying the work produced by these AI

interns, as their output is frequently mediocre, reflecting the “wisdom of the crowd” nature of their training on the entirety of human work (Smith, 2023).

In my experience, Chat GPT-4 adheres to the “garbage in, garbage out” principle (Wikipedia contributors, 2023), signifying a direct correlation between the quality of input and the resulting output. More often than not, I needed to prompt with additional instructions because the AI-generated response did not meet my expectations, such as when I forgot to instruct Marvin to maintain citation during a paraphrase or when the answer was simply incorrect. I found value in using prompts like:

“Can you tell me if this reads well?”

“Can you help me state this more concisely?”

“Help me combine these two thoughts into something more understandable?”

“Can you elaborate on what this statement means?”

“How might I rewrite this paragraph so it sounds more cohesive?”

My favorite prompt is, “Can you tell me more about (insert concept)?” In this context, I sought a generation of ideas to support my research or help me better articulate a particular point. Regardless of output quality, every piece required human review and editing, which I thoroughly enjoyed as a FourSight Analyst!

Huge shoutout to my trusty ChatGPT-4 sidekick Marvin, the dreamy electronic melodies of Boards of Canada, Season 3 of *Ted Lasso*, and the heavenly Sumatra Mandheling shade-grown organic coffee beans from Kornerstone that fueled my success.

SECTION SIX: CONCLUSION

In this Master's Project, I seek to captivate readers who are fascinated by the harmonious relationship between Creative Problem Solving and design thinking, as well as those attracted to the overarching theme of blending logical and emotional aspects in creative endeavors. Far from my long-standing goal of designing for others, this project is a personal milestone, reflecting my development as a graduate student in the Creativity and Change Leadership program at Buffalo State University and my unwavering dedication to refining design best practices. In essence, this project is a testament to my journey as a Designer, designed by me for myself.

Much of the knowledge and insights shared here have been acquired through classroom learning and professional experiences. Without this project, these valuable pieces of information would remain as disconnected fragments in my mind, floating aimlessly as I grapple with the cognitive challenges of bringing forth a coherent concept. I am grateful for the opportunity to synthesize these experiences, develop new insights, and shape this information into a form that will continue to guide and remind me throughout my career.

As I embark on the next chapter of my creative journey as an agent of creative change, I eagerly anticipate embracing and unraveling the complexities that lie ahead, continually refining and iterating my process along the way.

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