

DESIGN ATTITUDE AND SOCIAL INNOVATION:
EMPIRICAL STUDIES OF THE RETURN ON DESIGN

by

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Dedication

This dissertation is dedicated to the many individuals around the world who have crossed my path outside the professional framework of design and management cultures, and who will never read its contents. They represent the inspiration for its fundamental quest.

Their singular trajectories to overcome circumstances of hardship of many kinds exemplify the imagination and tenacity it takes to design an alternative and more humane future with boundless optimism. Their agency and actions impart essential purpose to my inquiry.

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Acknowledgements

In December 2010, I was invited to deliver a presentation at the 4th Biennial of Design in Santiago, Chile. The subject of my talk was focused on the innovative outcomes of an educational collaboration (*Safe Agua*) that had involved students and faculty from Art Center College of Design in designing products and services for a community living without running water in an informal settlement outside Santiago. By then, this initiative was characteristic of a series of experiential learning projects in partnership with industry, international development agencies and nongovernmental organizations (this one with the Latin-American based organization *Techo*) that I had been helping conceive and manage as part of *Designmatters*, the college's social impact department that I co-founded in 2001. Dr. Victor Margolin, Professor Emeritus of Design History at the University of Illinois, Chicago, had been invited that year to deliver the Biennial's keynote and attended my presentation. This was the first time I had met Dr. Margolin, whose scholarship I had always admired from afar, and I remember being bold enough somehow to impose on his schedule and invite him to join me for dinner. The evening would turn out to represent one of those momentous encounters that mark a turn of events in one's life journey. During that dinner, Victor proceeded to methodically and persuasively mount the argument that I should seriously consider pursuing a PhD. "You are engaged in an emergent field of design," I recall him telling me. "It is important to enrich your work with the theoretical frameworks it deserves...and I know exactly where you should go and who you should study with. I have this longtime colleague, Richard Buchanan; he is now at the Weatherhead School of Management at Case, in Cleveland. I will make the introduction." And so to Victor, I am profoundly grateful to for getting me

going on this doctoral journey. As it happened, by the following spring I had flown to Cleveland to meet Dick as well the Director of Academic Affairs for the Doctor of Management Program, Dr. Kalle Lyytinen, and the dedicated team behind the flawless administration of the program, Sue Nartker and Marilyn Chorman. Shortly thereafter I submitted my application, intent from the beginning to work with Dick as my dissertation chair and to commit myself to four years of study and research in order to complete the PhD track in *Designing Sustainable Systems*. It did not occur to me after that visit to research other programs in universities elsewhere, and, as someone with a Liberal Arts background coming into a Management school, I confess I did not even look closely enough at the coursework requirements to feel any form of trepidation about engaging in multiple years of advanced statistical analyses and the rigorous quantitative research that were required in the DM curriculum. I recall thinking that all that mattered was that I had the full support of my family and my colleagues at work (the two indispensable preconditions to sustain the level of commitment required to make it to the finish line, as Kalle cautioned in the application interview) and that I would be able to complete the necessary coursework in a residency-based program that had been designed for candidates who brought a rich life experience and a trajectory of leadership to their newly found academic goals. Except perhaps for my initial naïveté about the quantitative requirements that I would have to conquer—and eventually learn to value as one of the unforeseen gifts of my inquiry—the program and the doctoral journey that ensued met all my expectations and more.

There are numerous individuals to whom I am indebted to for their steadfast support as I embraced this venture.

At Art Center College of Design, the *Designmatters* team, several colleagues in the faculty, as well as the senior leadership of the college, including the provost and the president, were always encouraging of my progress, receptive to the new ideas from my studies that I would introduce in my practice, and generous in trusting me to continue leading a very full slate of initiatives with the concurrent demands of my coursework, research and international travel. Their collegiality accounts in no small measure for my success now as a committed practitioner-scholar.

This dissertation is comprised of three original empirical studies for which I assembled very rich data sets. Each study's data set reflects in many ways the aggregate perspectives, expertise and experiences of state-of-the art practices where designers are contributing in strategic and consequential ways to some of the most complex societal challenges that we face in the world today. I am privileged to have counted the support of many colleagues and friends in these organizations who opened their doors and made generous introductions to allow me access to conduct research in their midst. In particular, I would like to thank Jocelyn Wyatt, Patrice Martin and their team at IDEO.org; Robert Fabricant and his former team at frog design; Christian Bason and the team at Mind Lab; Bryan Boyer, Dan Hill and Marco Steinberg from the former Helsinki Design Lab; and Christopher Fabian and Erica Kochi and their team at the Innovation Unit of UNICEF. Their collective support represents an essential backbone of this inquiry and their practices an ongoing inspiration. I am also indebted to colleagues (known and unknown) from several of the design associations and networks that I belong to who were

kind enough to participate, endorse and promote the survey instrument I developed for my quantitative research, allowing me to secure a robust sample for analysis. I wish to also thank Dr. Kamil Michlewski for his openness and collegiality in sharing his scales and research insights, which have informed my own conceptualization of the *design attitude* construct that ended up anchoring this critical phase of quantitative inquiry.

Turning to Weatherhead, I was fortunate to study under the guidance of exceptional faculty throughout my coursework and I am grateful for their dedication in engaging and challenging me in domains of knowledge near and far from my field of research and practice. Among this group, it is the three scholars who comprise my dissertation committee who stand out the most for their influential mentorship. To Dick Boland, I am extremely appreciative for exposing me to his art of qualitative research and to the joy he holds for intellectual discovery; to JP Stephens, I am grateful for his nurturing guidance and for being a conversation partner who advanced my inquiry in critical ways, especially as I embarked in the ethnographic study of UNICEF; and to Kalle, I am beholden for his persevering despite my rather stubborn resistance to the concept of any “quant” in my research, and for patiently pushing me, over the course of two years, to accomplish with rigor perhaps one of the most original contributions of this dissertation. That process of collaboration and learning with Kalle which I know will continue forward, has not only taught me a new appreciation for quantitative research, but has also made me a more precise thinker and a more effective writer. Thank you.

John Dewey reminds us, “Inquiry is emancipated. It is encouraged to attend to every fact that is relevant to defining the problem or need, and to follow every suggestion that promises a clue.” My dissertation chair, Dick Buchanan, whom I am humbled to call

my teacher, has embodied and modeled for me this principle in more ways than one. Over the course of the many ebbs and flows of this inquiry, there were many times when I became hopelessly lost in the process of my research, others where I digressed dangerously, and even more times in which I felt completely inadequate for not going as far nor as deep in addressing the problem called for in order to find that promised clue. As my teacher, Dick knew when and how to intervene on each occasion—whether to offer a word of encouragement, impart sound guidance, or give me the necessary hard time—always setting me back on the right trajectory. I am grateful beyond words for his mastery and teachings over these past four years.

A final word of gratitude is directed to my closest friends and my family, who saw much less of me during this long period of time. To my parents, who were my first teachers and nurtured a deep sense of curiosity and wonder in me from an early age growing up around the world as a child of the diplomatic corps, I am deeply thankful. To my sons, Nicolas and Leonardo, who have suffered through fewer home-cooked meals, fewer family weekends and countless moments of non-attentive motherhood during this period—I owe you. And to my partner in life, my husband, Tony, for his unwavering friendship, wisdom and love—thank you.

Motivation

“Only that which is already known can be learned, that growth in knowledge consists simply in bringing together a universal truth of reason and a particular truth of sense which had been previously noted separately.”

*— Aristotle, cited by John Dewey in *The Reconstruction of Philosophy*, 1920.*

This statement resonates deeply with my personal journey of inquiry leading up to this dissertation’s completion. First of all, it signals the frequently intertwined nature between theoretical lenses and lived experience that one often brings to research: in my case, this inquiry has resulted in a new appreciation and aspiration for a deep practice of knowledge—one filled with the boundless possibilities that true learning affords us. Secondly, I believe it also articulates a central tenet about the concept of “engaged scholarship” (Van de Ven, 2007) that is championed in the learning environment of the Weatherhead School of Management and by way of the curricula of the PhD in Management *Designing Sustainable Systems*: creating a space to cultivate practitioner-scholars who are equally adept at studying complex problems, creating new knowledge *and* stepping back from their own inquiry to build bridges between theory and practice—with the capability of translating research outcomes into actionable knowledge. As a design educator and active practitioner in the social innovation field, I am keenly moved by deepening my understanding of how design may relate to our capacity as human beings to be, in the words of the philosopher Richard McKeon, “free in action, responsible in society and wise in the pursuit of knowledge” (Garver & Buchanan, 2000). I am inspired by the uncharted territory of circumstantial situations that I observe

firsthand in the complex projects in which I participate on an ongoing basis. Thus, a fundamental motivation behind this inquiry has been a profound commitment, as well as a sense of responsibility to contribute new scholarship to an emergent field of design practice that I believe stands to benefit from further articulation and insights.

The design for social innovation projects that I engage in through *Designmatters* at Art Center College of Design are not dissimilar to those included in this research, and consist of collaborations that on occasion have involved participants of my studies (i.e. designers at IDEO.org, frog design, members of the Innovation unit at UNICEF). In fact, the familiarity with the practice of the Innovation unit at UNICEF, for example, made the pursuit of the ethnographic research that forms the third study of this dissertation a reality.

Unquestionably, I have experienced what the mixed methods scholar Todd Jick has termed a “profitable closeness” to the issues investigated throughout this research journey (Jick, 1979). It is my hope that the account and analyses of my observations, informed by a worldview that continues to be influenced by the potent argumentative power of design in the face of many of the complex challenges of the 21st century, may translate into a an enriched explanation of the pluralism of practices, methods and circumstances that characterize how design and designers today shape and advance processes of societal change. And if so, the inquiry will have been worthwhile.

Preface

This dissertation represents a departure from established forms of inquiry in design research studies, and to a lesser degree it differs from dissertations in the management field, to which it also belongs. Hence, it seems beneficial to orient readers with a synopsis and a few preliminary observations that make explicit the choices made in treating its subject matter.

The aspiration of this dissertation is to reveal with disciplined coherence and powerful empirical evidence the unique value professional designers impart to processes of social change. The subject matter this dissertation investigates is the domain of design as a form of agency for social innovation, where the practices of design that I study are defined by unbounded conditions and complexity. In this regard, I seek to explain the phenomena of “design for social innovation” in a broad context, as a concrete human activity, grounded in the richness and contradictions of human experience and organizational practice. My inquiry builds upon a sequence of perspectives that progressively seek to clarify ideas and test hypotheses about the consequent problems and principles, as well as the promise and limitations of design in what remains an emergent field of knowledge and action—one ripe for more precise articulation and understanding.

The central argument I put forth with statements of fact and value is that by deepening our understanding of this emergent field, we may also gain new insights into the design discipline as a strategic organizational capability and as the source of momentous potential for human progress. This argument is driven by the overarching research question of the dissertation: *How might we elucidate the value designers bring to the emergent field of social innovation?*

My interpretations and analyses rely on original empirical evidence, collected and framed in a “mixed methods” exploratory design sequence that combines elements of qualitative and quantitative research approaches and multilevel units of analyses for the purposes of breadth and depth of understanding and triangulation of evidence. The research design consists of a sequence of three distinct but interrelated field studies (Chapters 1, 2 and 3) in which I investigate a pluralism of design methods and practices that are characterized by a wide range of cultural circumstances and institutional logics.

The multidimensional construct of “design attitude”—a relatively new concept in the design and management literature that places an emphasis on a holistic conceptualization of the unique abilities, capabilities and dispositions that professional designers espouse as they problem-solve and innovate—functions as an effective bridging *leitmotif* for the dissertation’s narrative arc and for the exploration of its core research question.

The quantitative methods of the dissertation’s central section (chapter 2) advances the progression of the dissertation’s inquiry in fundamental ways, as it invites us to test emergent theory about the predictive validity of design attitude in the context of social innovation. For design readers, the integration of this quantitative study may appear as one of the distinct anomalies in the dissertation. Quantitative methods undoubtedly represent a departure from common design research inquiries that favor qualitative methods, and seldom combine the two (as opposed to the field of management, and many other social sciences, where the case for mixed methods research has taken hold with relative strength for some time).

Beyond the fact that I had the privilege to be rigorously trained in quantitative analysis and could make use of quantitative research, my choice for the integration of these methods in the progression of this inquiry is governed by a deeper rationale that relates in turn to a more fundamental distinction of this dissertation: the art of dialectical inquiry that I adopt. As a method of reasoning, dialectic allows me to make sense of the emergent phenomena of design for social innovation by embracing the probable and the contradictory, by suspending judgment about the literal fixities and the paradoxes that I encounter in the phenomena of my empirical studies, and by gradually making inferences that have me advance from an understanding of the particular to the general issues that are at stake in the research, and eventually arrive at my thesis and the framework I propose for the “return on design.”

Hence, the themes and variations presented in each chapter, the choice of each study’s research design and methods of analyses, and the intentional sequence behind the presentation of the shifting perspectives of the three empirical studies—all constitute a part of the skeptical variety of dialectical inquiry that I pursue. I elaborate on this strategy in more detail in the research methods and discussion sections that follow, and for now I simply signal how its use as a “cathartic of understanding,” as Kant would refer to it, is germane to the emergent and often contested nature of problems in the subject matter of this inquiry, and to the sequence of discovery and choice of mixed methods that I pursue in the dissertation.

Design Attitude and Social Innovation: Empirical Studies of the Return on Design

Abstract

by

MARIANA V. AMATULLO

Today, in a world context defined by increasing complexity, deepening disparities and rising uncertainty, the imperative of connecting knowledge with action to create systemic social change and achieve more equitable futures for all human beings is greater than ever. The task is ongoing and necessitates both the adaptation of known solutions and the discovery of new possibilities.

This dissertation investigates the subject matter of design as a deeply humanistic knowledge domain that is drawing mounting attention and praise for its ability to open up new possibilities for action oriented toward social innovation and human progress. Paradoxically, despite unequivocal signs of such forms of design gaining prominence in our institutions and organizations, the unique value that professional designers impart to the class of systemic challenges and innovation opportunities at stake is an understudied pursuit that lacks articulation and merits elucidation. This dissertation contributes to filling that critical gap.

Integrating theories of social innovation, organizational culture, institutional logics and design, and building on the construct of “design attitude” (a set of unique

capabilities, abilities and dispositions espoused by professional designers and that are related to organizational learning and innovation), the dissertation relies on the interpretation and analyses of three independent field studies organized in a multiphase mixed methods exploratory design sequence. The dissertation is organized in a dialectical progression that presents the following overarching research question: *How might we elucidate the value designers bring to the field of social innovation?*

The first study combines a grounded theory approach with a comparative semantic analysis of four case studies of design for social innovation projects (conducted with design teams from IDEO.org, Frog Design, Mind Lab and the former Helsinki Design Lab). The insights culled from semi-structured interviews of designers and managers with a high fluency of “design attitude” point to a unanimous concern to claim, with more clarity, the value of design as a means to achieve social innovation.

This central finding informs the research design of the second study, a quantitative investigation composed of a field survey that offers an aggregate view of the positive significant relationships between the multidimensional construct of design attitude (and the five first-order dimensions of the construct that we operationalize as creativity, connecting multiple perspectives, empathy, ambiguity tolerance, and aesthetics) and social innovation project outcomes, team learning and process satisfaction, as reported by managers and designers with a high level of design fluency practicing predominantly in the social and public sectors. The study presents a set of foundational metrics that explain with new evidence how and why design matters in the domain of social innovation.

The third study of the dissertation uses an ethnographic case study approach to extend the statistical insights from the prior study and probe the manifestations of design attitude in the organizational context of the Innovation Unit at UNICEF. A key finding is the identification of a number of enablers and inhibitors that advance and alternatively collide with efforts to promote and integrate design attitude capabilities as part of the organization's overall innovation agenda. In this study, the themes of accountability and urgency emerge as important macro-level forces that define the institutional logics of UNICEF and impact the agency of design attitude at the individual level of its organizational actors.

Collectively, and through the sequence of perspectives that they offer, these three empirical studies reveal with disciplined coherence and powerful evidence a set of principles and capabilities that further clarify the significance of design attitude for social innovation.

From a theoretical perspective, this dissertation advances our understanding of the possibilities, limits and implications of design for social innovation amidst a multidisciplinary landscape characterized by a pluralism of emergent practices, a diversity of methods and a wide range of cultural circumstances. At the core of its theoretical contribution is a new framework that conceptualizes what we call the “return on design” (ROD) for social innovation.

From a perspective of practice, this research offers new insights into how organizations might recognize and more confidently integrate key design attitude capabilities that can result not only in social innovation outcomes, but also in broad organizational impact and human progress.

Key words: design; social innovation; organizational culture; institutional logics; design attitude; design thinking; design practice; dialectics; ethnographic case study; innovation; mixed methods; metrics for social innovation; prototyping; visualization; team learning; process satisfaction; nomological; predictive validity; construct validity.

INTRODUCTORY CHAPTER

The Problem of Practice and the Inquiry's Objective

Today, in a world context defined by increasing complexity, deepening disparities and rising uncertainty, understanding how designers contribute to the imperative of connecting knowledge with action to create systemic social change and achieve more equitable futures for all human beings is greater than ever. The task is ongoing and necessitates both the adaptation of known solutions and the discovery of new possibilities.

The significance of the highly dynamic actions that designers are responsible for as they align decisions with impact and work together, and with others, across disciplinary boundaries to innovate, cannot be over-stated. In their most essential roles, designers deal with concrete and objective results, the consequences of which affect us all—shaping the form, function and symbols of our world: from the visualization, ideation and planning of images, products and services, to the strategic conceptualization of systems and environments (Margolin & Buchanan, 1995). As a “reflective” community of practice (Schön, 1983), and as a pluralistic field for inquiry adept at tackling wicked problems (Buchanan, 1992; Rittel & Webber, 1973), the discipline of design can open up paths creating forms of collaboration and generative modes of intervention that can lead to social innovations—new ideas that satisfy unmet needs and enhance society's capacity to act (Mulgan, Tucker, Ali, & Sanders, 2007). In this sense, the essentially unbounded space of design allows us to embrace alternative futures and shy away from prescribed courses of action (Simon, 1969).

However, in spite of unequivocal signs of growing worldwide interest in applying design methods and design thinking to social and public sector challenges (Boyer, Cook, & Steinberg, 2011; Julier, Kimbell, Bailey, & Armstrong, 2014), understanding how design may help achieve impact is fraught with difficulty. On the one hand, the social innovation field is more complex than traditional industrial and technological innovation, for example, partly because it happens at the crossroads of multiple sectors and disciplinary boundaries (Murray, Caulier-Grice, & Mulgan, 2010) with fields of application ranging from governance, policy, international development, education, healthcare and poverty alleviation, to name but a few (Armstrong, Bailey, Julier, & Kimbell, 2014). On the other hand, we are at a critical time, when some of the leading practitioners who are engaging in the social and public sectors are signaling that concurrent with the promise of design's agency for social innovation, and its potential to develop into one of the defining fields for agency of the next decades, is the risk of design not rising to its full potential and becoming "a fad that failed" (Boyer et al., 2011; Mulgan, 2014). The lack of articulation about design's lasting value in provoking beneficial processes of social change is consistently cited as a key culprit. There is a widespread sentiment from practitioners at the frontlines of these practices that they are working in, and responding to, a context where evidence is still developing, information is incomplete and debate about impact is constant in the face of the near-absence of systematic evaluation and measurement (Mulgan, 2011).

In this dissertation I address head-on that critical gap in our understanding. I investigate the subject matter of design as a deeply humanistic knowledge domain that opens up new possibilities for action oriented toward social innovation and human progress in an emergent context, where there is a pervasive sense of dynamic relations and modes of innovating being developed against dominant social and cultural systems in our organizations and institutions (Williams, 1977).

The overarching research question that drives forward my inquiry is the following: ***How might we elucidate the value designers bring to the emergent field of social innovation?***

I interpret the question through three distinct and interconnected empirical studies in which I follow a dialectical mode of reasoning (McKeon, 1954) that allows me to gradually move from a set of multiple meanings and ambiguous answers that address the overarching research question of the dissertation and the particulars that stem from each study (the principles, consequent problems, promise and limitations of design in the social innovation context), to a less ambiguous resolution to the problem at hand. The meanings that I cull from analysis to analysis eventually lead me to propose a framework that conceptualizes what I call the “return on design” (ROD) for social innovation.

The progression of my inquiry is organized in a multi-phase exploratory mixed-methods sequence in which I make sense of the phenomena, and shifting perspectives about design and social innovation that I encounter in each of the three empirical studies of the dissertation, by interweaving qualitative and

quantitative methods of analysis. These studies are constituted by four cases of social innovation projects that reveal the shifting roles of design amidst a pluralism of practices that share an overarching purpose for social change (chapter 1); a field survey that measures design capabilities, practices and techniques and their impact on the outcomes of social innovation projects (chapter 2); and finally, an ethnographic study of an organizational division at UNICEF that integrates design thinking and practices as part of their innovation mandate (chapter 3). I utilize the multi-dimensional construct of *design attitude* (Boland & Collopy, 2004; Boland, Collopy, Lyytinen, & Yoo, 2008; Buchanan, 2008; Michlewski, 2008, 2015), which I view as a set of abilities that impact innovation and organizational learning and as a concept that captures designers “liquid and open orientation to projects” and their deeply aspirational and humanistic orientation to innovation (Boland & Collopy, 2004: 9), to construct a narrative arc for the dissertation that both relates back to my general research question and generates a subset of research questions for each of the three empirical studies.

My central hypothesis in the dissertation is that by deepening our understanding of the agency of design attitude for social innovation in an emergent context of action, we may also gain new insights into the design discipline as a strategic organizational capability and as the source of momentous potential for human progress.

The remainder of this introductory chapter of the dissertation is organized as follows. First, I review the relevant literature streams on design, social innovation, organizational culture and institutional logics that served to anchor

my hypotheses. Next, I present the research design of the inquiry and discuss the rationale behind the exploratory mixed-methods sequence that I follow. I conclude the introduction with a discussion about the dialectical strategy of inquiry of the dissertation and a presentation of the theoretical framework that grounds my research.

Literature Review and Theoretical Foundations

The focus of this dissertation's inquiry, deepening our understanding of design attitude in the context of social innovation, called for my pursuing a multi-disciplinary approach to theory generation which implied that I had to review a wide breadth of literature streams, some of which are not necessarily nor typically combined in design and management studies. My bringing some of these streams together by way of necessity—given the phenomena I investigated in my empirical studies—might actually represent one of the overall contributions of note of this inquiry. In this subsection I offer an overview of the four principal bodies of literature and the principal theoretical foundations that anchored my research questions and informed my hypotheses: that of design (and design attitude), social innovation, organizational culture, and institutional logics. I synthesize some of the important concepts and theoretical streams within these literatures that influenced my research; I review key variations and themes within each, and when relevant, I signal key theoretical gaps that I identified as I combined them and progressed through my inquiry. In-depth reviews of these streams and slight variations of emphasis in the themes (along with some repetition the reader will encounter with sections of this synthesis) are to be found

in the individual literature review sections corresponding to each empirical study in chapters 1, 2 and 3.

As my inquiry's chief intent was to elucidate the unique value that design and designers may bring to the field of social innovation, my starting point for my examination of the literature, and one I carried over to each of the phases of the research as I progressed through the three empirical studies, was to focus on an examination of key definitions and variations of design treated as a broad discipline of knowledge, and as a proactive, concrete human activity within a larger cultural system, grounded in the richness and complexity of human experience (Buchanan, 2007).

Design in the Ecology of Culture: Philosophical Lenses of Note

My conceptualization of design in this inquiry is influenced by a lineage of philosophical thought in the twentieth century that can be traced to American philosophers John Dewey and Richard McKeon. The latter's framework for philosophical inquiry and his erudition in treating "culture as a pluralistic interplay of ideas and methods, of facts and values, of commitments and inquiries" (Buchanan, 2000) in turn informed one of his disciples, Richard Buchanan, who guided my inquiry in this dissertation, and whose body of theoretical work about design thinking and design practices as a discipline represents a core foundation for my own research and interpretations.

Dewey's Pragmatism

The philosophy of John Dewey informs how I view many of the emergent design practices that I observe first hand throughout the three empirical studies.

Dewey characterized inquiry as a process that can often be considered “uncertain, unsettled, disturbed” (Dewey, 1938, reprint, 2008). Some of the primary concepts about the dynamic and interactive aspects of experience that he espouses in *Art as Experience* (Dewey, 1934) as well as his views on primary structures of methodological inquiry from *Logic: The Theory of Inquiry* (Dewey, 1938, reprint, 2008), which have been instrumental in informing the design methods literature at the end of the twentieth century and into contemporary critical writing (DiSalvo, 2012), help explain many of the circumstances of design that emerge from the four case studies (chapter 1) and the ethnography of UNICEF (chapter 3). These are situations where designers often find themselves approaching design challenges and design “briefs” that demand from them problem seeking as much as problem solving, and where the challenge gradually comes into view with the generative questions that arise throughout the pursuit of the project:

“Inquiry is the controlled or directed transformation of an indeterminate situation into one that is so determinate in its constituent distinctions and relations as to convert the elements of the original situation in a unified whole.... A problem represents the partial transformation by inquiry of a problematic situation into a determinate situation. It is a familiar and significant saying that a problem well put is half-solved” (Dewey, 1938, reprint, 2008: 104–115).

McKeon: A Pluralism of Frameworks

The deeply humanistic philosophy of Richard McKeon (McKeon, 1948, 1950, 1954, 1964, 1968, 1990) provides this inquiry with seminal scaffolding. McKeon saw in the ecology of culture the interrelation and interdependence of diverse perspectives in knowing, doing and making in all areas of human activity

that have profound implications for how I consider the discipline of design and its place within that framework of culture (Garver & Buchanan, 2000). McKeon's framework positions cultural manifestations not as fixed or permanent, but as a continuous and evolutionary process of inquiry and experience that also echoes the characterization of culture by Dewey, his former teacher (Dewey, 1966). This is a dynamic process of reconstruction of experience governed by principles that are concerned with how we think and act as human beings, within the diversity of a community context that celebrates both common problems and common values, as much as the freeing possibilities that come from the introduction of new, and/or different views (Garver & Buchanan, 2000; McKeon, 1998). McKeon's insistence that "the frame of reference for mankind must preserve the pluralism of frames that made possible advances in knowledge, in culture and in community" (McKeon, 2005: 281) is of consequential inspiration to my research as I consider situations where designers are bridging knowledge with action to innovate and engage in processes of social reconstruction of communities.

The Organizational Culture Stream

Key perspectives from the interdisciplinary field of cultural studies inform my inquiry and become especially relevant in the third ethnographic investigation about how design attitude approaches manifest in the organizational context of the Innovation Unit of UNICEF. The domain of organizational culture provides an influential lens to my interpretations in this study, and informs overall the integrated findings of the dissertation. As Edgar Schein has pointed out in his research on organizational development, the often-contested concept of "culture"

in organizations can be of particular value in studies that derive from observations of real behavior and seek to make sense of organizational data, which is the case of this empirical research (Schein, 1996). The reflexive review of the terrain of organizational cultural studies by organizational behavior scholar Joanne Martin has demonstrated since then that when culture is treated, not as a variable, but as a root metaphor for organizational life (i.e. as a way to study everyday life in organizations), the question of scope quickly arises. The concept of “culture” often lacks conceptual clarity amidst a large and diverse body of literature that crosses disciplinary and methodological barriers (Martin, 2002a). Given the research questions I had that were intent on gaining a deeper understanding of design within complex organizational contexts, I deemed it essential to probe aspects of organizational cultural dynamics as a metaphor indicative of particular forms of human expression (Smircich, 1983). My analyses espouse a behavioral perspective within the range of organizational culture definitions. I expand upon Edgar Schein’s functional definition of organizational culture as a “learned product of a group experience based on a group’s set of values, norms and assumptions” (Schein, 1985). Per Martin, I subscribe to the notion that “cultural manifestations of a group’s set of values, norms and assumptions include formal and informal practices, organizational stories and rituals, jargon and language, humor, and physical arrangements” (Martin, 2005). I also realize these manifestations may not necessarily be always uniformly *shared* (Frost, Moore, Louis, Lundberg, & Martin, 1985; Sergiovanni & Corbally, 1986) or *unique/distinctive* to the group of study (Smircich & Calás, 1987). I examine

cultural manifestations as “patterns of meanings that link these manifestations together, sometimes in harmony, sometimes in bitter conflict between groups and sometimes in webs of ambiguity, paradox, and contradictions” (Martin, 2002a: 3).

Design Practices for Social Innovation in an Emergent Culture

The perspective of the Welsh cultural critic Raymond Williams, and the emphasis he places on the complex, dynamic interrelations that characterize cultural processes, adds important insights to my research as I sought patterns of meaning within the cultural environments that I studied both in the four case studies (chapter 1) and in the Innovation Unit at UNICEF (chapter 3). Williams’ concept of *emergence* within an organizational environment, a concept that refers to *the process of coming into being or prominence*, is posited as a locus “where new meanings, values, practices and new relationships and kinds of relationships are continually being created” (Williams, 1977: 123). Importantly, Williams clarifies that the emergent does not necessarily equate with the merely novel, but instead presupposes a substantial alternative or oppositional force to what we might see as the dominant state of affairs characterizing trends and activities fully accepted and mainstream. In other words, the emergent can only be fully defined and understood vis-à-vis the dominant. At the opposite end of the spectrum, Williams defines the “residual” (practices formed in the past that may be fading from view but are still effective elements of the present, dominant culture). By calling attention to these relational dimensions and variations that cultural manifestations bring forth, Williams helps ground my interpretations of the many seemingly “emergent” social innovation practices and design attitude approaches

that manifest throughout the study. His perspective is useful in reminding us that expressions of change that diverge from the vested interests and norms of a dominant culture are not always easily rationalized (Boyer, Cook, & Steinberg, 2013). This is relevant to the dynamic relations and some of the tensions that I observed throughout my empirical studies.

Action-Oriented Design in Contemporary Culture

Richard Buchanan's conceptualization of culture as a relational activity and pluralistic system that designers and the act of designing must engage with is of central significance to this study, and is one that builds upon McKeon. "Culture is the activity of ordering, disordering, and reordering in the *search* for understanding and for values which guide action" (Buchanan, 1998: 19). With this notion, design is considered as a potent cultural activity in the framework of organizational life, one capable of addressing concrete and objective results that affect all human beings. Per this perspective, designers have a unique capability to become adept cultural explorers, ones deeply in tune with the problems and treatments of human experience (Buchanan & Margolin, 1995). This view is keenly relevant as I consider the agency that design attitude may exhibit in the context of social innovation in this dissertation. In addition, I adhere to Buchanan's conceptualization of design that 1) encompasses a pluralism of subject matters, 2) takes on a variety of forms (from communication artifacts, to products, services, systems and environments), and 3) deploys a wide range of methods (Buchanan, 2009). Buchanan's important classification of the "four orders of design" distinguished by their design object (symbols, things, action and

thought) as “places in the sense of topics for discovery” (Buchanan 2001) add an importance lens of insight to my interpretations as many of the projects I study fall in the fourth order of that classification.

By treating design as discipline in the framework of culture that is also a mode of inquiry rather than as a distinct professional competency that is the purview of the “omnipotent designer,” or the designer as “hero,” I align my research in this dissertation with contemporary streams of design discourse that point to design practices that exist in increasingly complex organizational settings and interdisciplinary and collaborative contexts of use (Binder et al., 2011; Jégou & Manzini, 2008; Staszowski & Manzini, 2013). In these situations, there is a recognition of the integrative and generative quality of design and an increasing validation of design’s capacity to act as a mediating discipline that is fundamentally about contributing to processes of decision-making through stewardship and the act of making (Boyer et al., 2013; Kimbell, 2009). The notion of stewardship as it relates to design aimed at societal change is of particular importance in this dissertation since it situates design as a means to addresses a class of challenges that are complex and systemic in nature, which are the kinds of practices that I encounter throughout the three studies.

Design as Argumentation

Important theoretical frameworks in the history of the design science field and management—that of Herbert Rittel, Herbert Simon and Donald A. Schön—represent another stream of the literature that informed my analysis of the nature of design abilities and the implications of it in understanding the agency of design

amid organizational practice. I discuss the influence of all three in more detail in my review of the literature in chapter 1. As a synthesis here I underline three main concepts from their influential work that I take forward into this inquiry, and I dwell on Rittel further.

My theorizing in all three studies is informed by Simon's emphasis on the cognitive ability of design to devise alternative futures (Simon, 1969), by Schön's humanistic perspective about design as a process that is fundamentally reflective (Schön, 1983), and by Rittel's emphasis on the power of design as argumentation. The latter informed my own theorizing, perhaps the most. Rittel attempted to clarify designers' logic, and wrote extensively about the ability designers have to make sense of a cohesive whole through the argumentative power of a design process that plays out amid the complexity of fluid social circumstances (Rittel, 1987). There are two main contributions in Rittel's proposed framework of "the reasoning of designers" that stood out in this inquiry: first of all, his articulation of the "epistemic freedom" that designers exhibit in decision-making. Here, the important implication is that there is a unique agency of design in determining and selecting future courses of action, a process that is conducive to innovation. The data from both qualitative studies in this dissertation points to several situations where that process of argumentation represents a way to anticipate future scenarios and have at the ready several ways to move forward. A second point of relevance for this inquiry overall lies in Rittel's deconstruction of the "disorderly" process of designing. He defines that process as one characterized by debate and discussion, and he highlights the argumentative

capability of design, one that leads to invention in the face of ill-defined, “wicked” problems that often present conflicting information and values and where the ramifications of the whole system are confusing (Rittel & Webber, 1973). In this sense, Rittel’s often referenced dictum, “Learning what the problem is *IS* the problem” (Rittel, 1987), can be considered in many ways a starting point for a phase of design discovery that guides many of the practices I studied (both in the case studies and in the Innovation Unit at UNICEF) ones which follow well-established design thinking practitioner methods for human-centered design (Brown, 2009; Brown & Wyatt, 2010; Dalberg, 2014).

Participatory Design, User Participation, Human-Centered Design

Given the focus of this study on design attitude and social innovation, the considerable body of literature on “participatory design,” harking back to its origins in the Scandinavian social democratic model of the late 1970s were important to review. Participatory design, and practitioner-based methods of “human-centered” design (Brown, 2009; Dalberg, 2014; IDEO, 2008; Junginger, 2005) are prevalent in the domain of my research and well established. Design teams can draw upon the tacit knowledge of users to identify issues and solutions that may otherwise elude them (Press & Cooper, 2003). In the practices I studied, participatory design and processes of co-creation that place people at the center of the design exploration and process—beyond reducing them to “end users,” are at the forefront of design research approaches to social innovation which deploy empathic engagement for critical insights in open-ended processes of innovation and collective co-creation. These practices are profoundly reshaping processes of

co-design and co-production in the public and social sectors (Jégou & Manzini, 2008; Staszowski & Manzini, 2013). The robust stream of design research (Binder & Brandt, 2008; Mattelmäki, 2005; Sanders, 2002; Sanders & Stappers, 2012), including that of the referenced Scandinavian Participatory Design school, represent an important anchor to this inquiry and elucidated my analyses in all three empirical studies. While these streams of theory and empirical literature of the importance of participatory design in promoting social change are key to my research, I also contribute to addressing a gap in the literature by probing the impact of these practices in the quantitative study of the dissertation and including participatory design as the variable “user participation” in the model of that study. In order to do this, however, I had to go beyond the design literature on participatory design in order to adapt validated scales to measure the role of user participation and its impact in social innovation. I looked to the domain of information systems, where the concept of participatory design has been investigated as the construct of “user participation.” The work of information systems scholars Hartwick and Barki (Barki & Hartwick, 1994; Hartwick & Barki, 2001) informed my conceptualization and interpretation of participatory design processes. These authors operationalize the construct of user participation with four distinct dimensions (communication, hands-on activity, influence and responsibility) that align well with design processes that can be observed in fairly clear-cut ways in practice; I used their theoretical and empirical framework in chapter 2 and my combination of this stream to the design literature of

participatory design thus represents a departure of note in my framing of these practices in the inquiry.

Design Attitude

Given the importance of the concept as a leitmotiv in this dissertation, I undertook an extensive literature review on the relatively recent concept of design attitude, and sought to also understand how key disciplines have explained “attitude” in itself. In this study, I treat design attitude *as a set of abilities that impact innovation and organizational learning* (Boland & Collopy, 2004; Boland et al., 2008; Buchanan, 2008; Michlewski, 2008). First coined by Boland and Collopy (2004), this construct has been posited as a valuable factor that influences positively generative inquiry and action in management (Boland & Collopy, 2004; Boland et al., 2008). Boland and Collopy defined design attitude as “expectations and orientations one brings to a design project” (2004: 9), highlighting designer’s capabilities as a distinct set of heuristics that deviate from more linear aptitudes for decision-making of managers. My inquiry builds on this conceptualization and on the important research of Kamil Michlewski (2008, 2015) who embarked on the first in-depth empirical review of the underlying dimensions of design attitude. My development and operationalization of design attitude is also influenced by the theoretical review of Michlewski’s work by Richard Buchanan (2009, unpublished. See Appendix A). Based on these robust theoretical and empirical streams in the literature on design attitude, my contribution resides in establishing the construct’s validity for the first time, which I do in the quantitative study (chapter 2) by conceptualizing a new

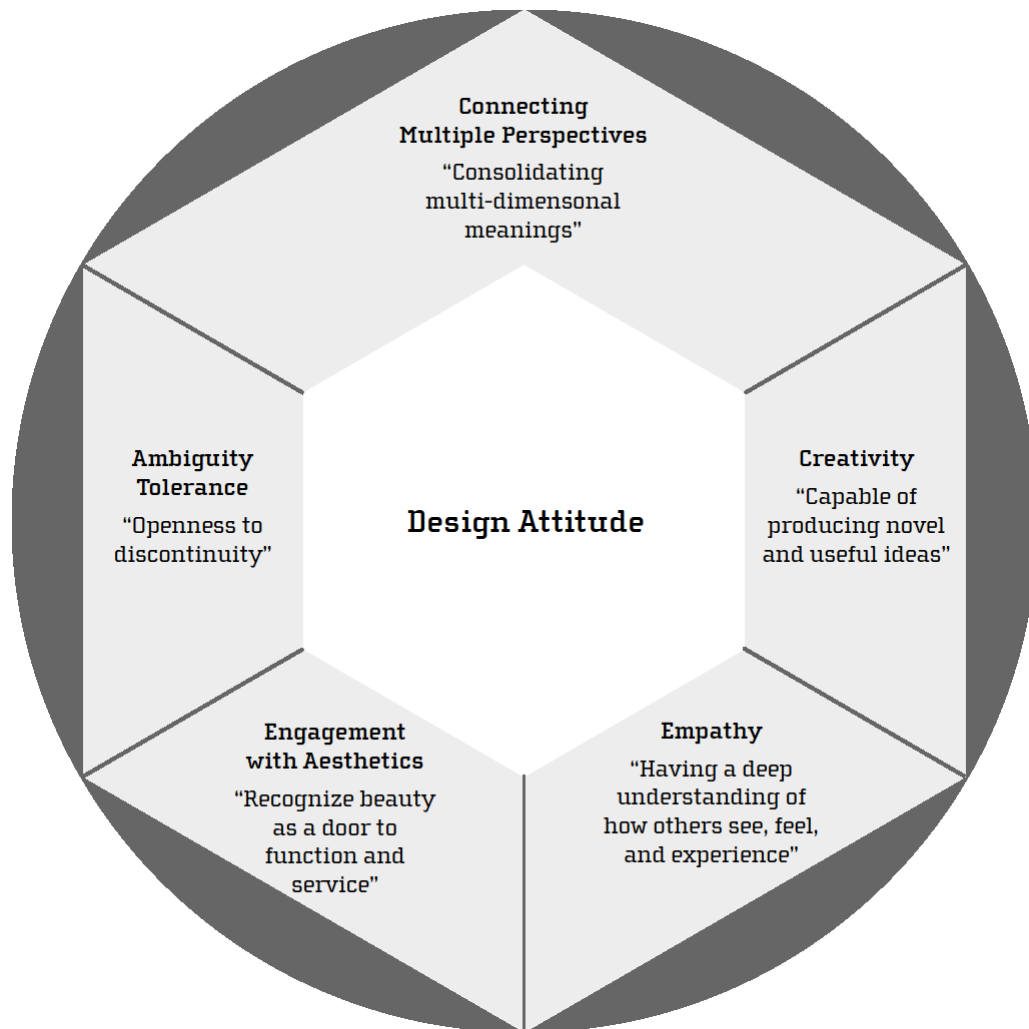
(operational) definition for design attitude. I put it forward as an aggregate, or formative, second-order multidimensional construct. Specifically, I define design attitude as *a composite of distinct abilities (skills, capabilities, aptitudes) that designers apply during the process of designing*; while I first propose six first-order dimensions of these abilities: 1) *ambiguity tolerance*; 2) *engagement with aesthetics*; 3) *systems thinking*; 4) *connecting multiple perspectives*; 5) *creativity*; and 6) *empathy*, my analyses in the quantitative study only allowed me to validate five with systems thinking being the dimension that could not be validated. Figure 1 provides a graphical representation of the five validated and operationalized dimensions along with their corresponding definitions. I further probed these dimensions in the final empirical study of the dissertation (chapter 3). For the purposes of avoiding redundancy, please refer to chapter 2 for a more detailed review of this conceptualization. Table 1 summarize the conceptualization to date of design attitude that has been a foundation for this study. Figure 1 presents the design attitude dimensions included in the study.

Table 1: Design Attitude Conceptualization in the Literature

DESIGN ATTITUDE	AUTHORS			
Construct conceptualization in the literature	Richard Boland & Fred Collopy <i>Managing as Designing</i> 2004	Kamil Michlewski “Uncovering Design Attitude,” <i>Organization Studies</i> 2008	Richard Buchanan “The Design Attitude” 2009 (concept map adapted and revised from Michlewski, not published)	Kamil Michlewski “Design Attitude Survey Instrument” 2013 (personal communication)
Construct Definition	“expectations and orientations one brings to a design project”	Expands Boland & Collopy’s reference to design attitude as “means of creating products, services and processes that are both profitable and humanly satisfying” and indirectly defines design attitude as the “ <i>character of a professional culture shaped by designers</i> ”	“abilities and capabilities” of the designer as cultural explorer	
Attributes and Items	Unique set of heuristics for decision-making that differ from management; emphasis on agency of the design approach: Liquid and open orientation to projects; invention	Identifies 5 theoretical categories /dimensions that are in turn distinctively defined: 1) ‘consolidating multidimensional meanings’ [reconciling contradictory objectives; bridging approaches; swinging between synthesizing and analyzing]	Adapts and revises the 5 theoretical categories/dimensions with humanistic emphasis of the design approach: 1) ability to see the whole situation [make connections; analytic and synthetic perspectives; consolidate multi-dimensional meanings] 2) passion for bringing ideas to life	Makes slight revisions to categories for operationalization of the construct’s dimensions in survey: 1) connecting

of new alternatives • Questioning of assumptions • Resolve to contribute to human betterment	2) ‘creating, bringing to life’ [creative manifesting; rapid prototyping; working with tangibles] 3) ‘embracing discontinuity and open-endedness’ [allowing oneself not to be in control; linear process and detailed planning vs “let’s see how it goes”; freedom to think and behave differently] 4) ‘embracing personal and commercial empathy’ [concentrating on people; human-centeredness; transparency of communication] 5) ‘engaging poly-sensorial aesthetics’ [visual discourse; visual thinking; creative dialogue; aesthetics; beauty; taste; intuition; instinct; tacit knowledge]	[delight in wonder and surprise; delight in making ideas concrete; delight in creative action] 3) willing to take risks without fully knowing the outcome [embrace discontinuity and open-endedness; embrace ambiguity and improvisation as essential to innovation; embrace change; brave and courageous in exploration; willing to avoid premature closure] 4) ability to empathize with the human side [concern for people; ability to communicate; feel empathy for customers as well as commercial interests; ability to balance ego and play in groups] 5) willing to visualize and explore all of the senses to seek solutions [appreciate the aesthetics of human experience; awareness of the visual can break creative deadlock and stimulate dialogue; possess a sense of beauty but recognize that beauty opens the door to function and service]	multiple viewpoints and perspectives 2) playfully bringing things to life 3) embracing uncertainty 4) engaging in deep empathy 5) using the power of the five senses
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Figure 1: Design Attitude Dimensions in the Study



Social Innovation

Social innovation is considered a “practice-led field”—whereas understandings, definitions and meanings have partly emerged through people doing things in new ways rather than thinking about them in an academic way (Grice, Davies, Robert, & Norman, 2012). My review of the literature has signaled several gaps that make a precise conceptualization of the term challenging. This is due to the fact that as a subject matter, social innovation is characterized by 1) a diversity of domains of knowledge that are

informing the literature streams on the subject: from economics and public policy to design and management studies, and 2) the cross-sectorial and multi-disciplinary nature of the field itself, one that cuts across boundaries of action, results in a diversity of meanings and users of social innovation that consequently open up the term to multiple applications and interpretations. In this inquiry I define social innovations as *a new solution (product, service, model, process, etc.) that simultaneously meets a social need (more effectively than existing solutions) and leads to new or improved capabilities and relationships and better use of assets and resources that may enhance society's capacity to act* (Grice et al., 2012; Moulaert, Martinelli, Swyngedouw, & Gonzalez, 2005). This definition of social innovation encompasses three core elements that are relevant to the design practices this dissertation presents throughout its three empirical studies: 1) novelty: social innovations are new to the field, sector, region, market or user and represent an intervention that can be applied in a new way and imply invention; 2) societal impact: social innovations are explicitly designed to meet a recognized social need and enhance society's capacity to act (Murray et al., 2010); and 3) from ideas to implementation: social innovations imply the application and implementation of ideas and new value creation (Grice et al., 2012).

The ongoing TEPSIE research program (Grice et al., 2012), a multi-institutional European research collaboration that aims to deepen our understanding of the theoretical, empirical and policy foundations for developing the field of social innovation in Europe—is a body of research that informed the analysis of my empirical studies in

significant ways.¹ The initiative signals the growing importance of re-defining social innovation in Europe as radical shifts in government policies and resources are impacting some of the established principles and benefits of many the continent's welfare states. The research from the report openly aims to also fill a gap—given a relative lack of empirical and theoretical studies that explain social innovation phenomena globally—in our knowledge and understanding about the barriers to innovation, as well as the structures and resources that are required to effectively address contemporary social and environmental challenges.

The term social innovation has been used to describe very distinct content, processes, and outcomes and emerges as a multi-dimensional concept that carries five principal dimensions which can be enumerated and qualified as follows and that I consider throughout my inquiry (Grice et al., 2012):

- **societal transformation** (i.e. this includes the extensive literature on the role of civil society in participating in processes of social change and transformation that are blurring boundaries between for-profit and non-profit sectors and include discourses of corporate social responsibility)
- **models of organizational management** (i.e. this refers to discourses including Porter's concept of "creating shared value" (Porter & Kramer, 2011) that focus on business strategy related to changes in human, social and institutional capitals that can lead to organizational effectiveness and competitiveness)

¹ A limitation in my literature review is that I did not take a historical approach to my articulation of this stream of literature, which is informed by the disruption and breakdown of many of the robust systems in traditional welfare societies in Europe.

- **social entrepreneurship** (i.e. this includes the work of Greg Dees and Ashoka founder Bill Drayton (Dees, 1998; Dees & Anderson, 2006) that emphasizes the ability of individuals to be “change agents” and tackle intractable social challenges through the creation of new products and services, and is also tied to the school of thought about commercial entrepreneurship and the opportunities to exploit new market ventures)
- **the development and practical implementation of new products, services and programs** (i.e. this includes the literature on public sector innovation and public sector provision by social enterprises and civil society organizations (Moulaert et al., 2005))
- **model of governance, empowerment and capacity building** (i.e. this literature examines the process dimension of social innovation and inter-relations between different actors and social capital assets that may lead to the implementation of innovations (Gerometta, Haussermann, & Longo, 2005)).

Table 2 below from the report (p. 8) further summarizes the five broad uses of the term social innovation and outlines the examples of literature topics of these dimensions.

Table 2: Summary of Five Broad Uses of the Term Social Innovation

Examples of literature topics	Examples of literature topics
Processes of social change and societal transformation	• Role of civil society in social change • Role of social economy and social entrepreneurs • Role of business in social change
Business strategy and organizational management	• Human, institutional and social capital • Organizational efficiency, leadership and competitiveness • Sustainability and effectiveness of non-profits
Social entrepreneurship	• Role of individuals in creating social ventures • Behaviors and attitudes related to social enterprise • Businesses focused on social objectives with any surpluses re-invested
New products, services and programmes	• Public sector innovation • Public service provision by social enterprises and civil society organizations
Governance and capacity building	• Interrelationships between actors and their skills, competencies, assets and social capital in developing programmes and strategies

Source: Grice et al., 2012, p. 8 (TEPSIE, *Defining Social Innovation*, Part 1).

The Institutional Frame: Institutional Logics

This dissertation is informed by a diverse and rich body of literature in institutional logics. It is a stream that I investigated towards the end of my inquiry, as I tackled the ethnographic case study of UNICEF and then incorporated this stream to make sense of my integrated findings as well. My perspective of institutional logics benefits from the scholarship of Patricia Thornton and William Ocasio (Thornton & Ocasio, 2008; Thornton, Ocasio, & Lounsbury, 2012) who have reviewed in depth the historical variations of the concept in the context of the development of institutional theory since the 1970s. Their research not only illuminates our understanding of how institutions influence and shape cognition and action in individuals and organizations, but also how in turn they are shaped by them. Their critical analysis and illustration of the relevance of institutional logics as a meta-theory and method of analysis is of great

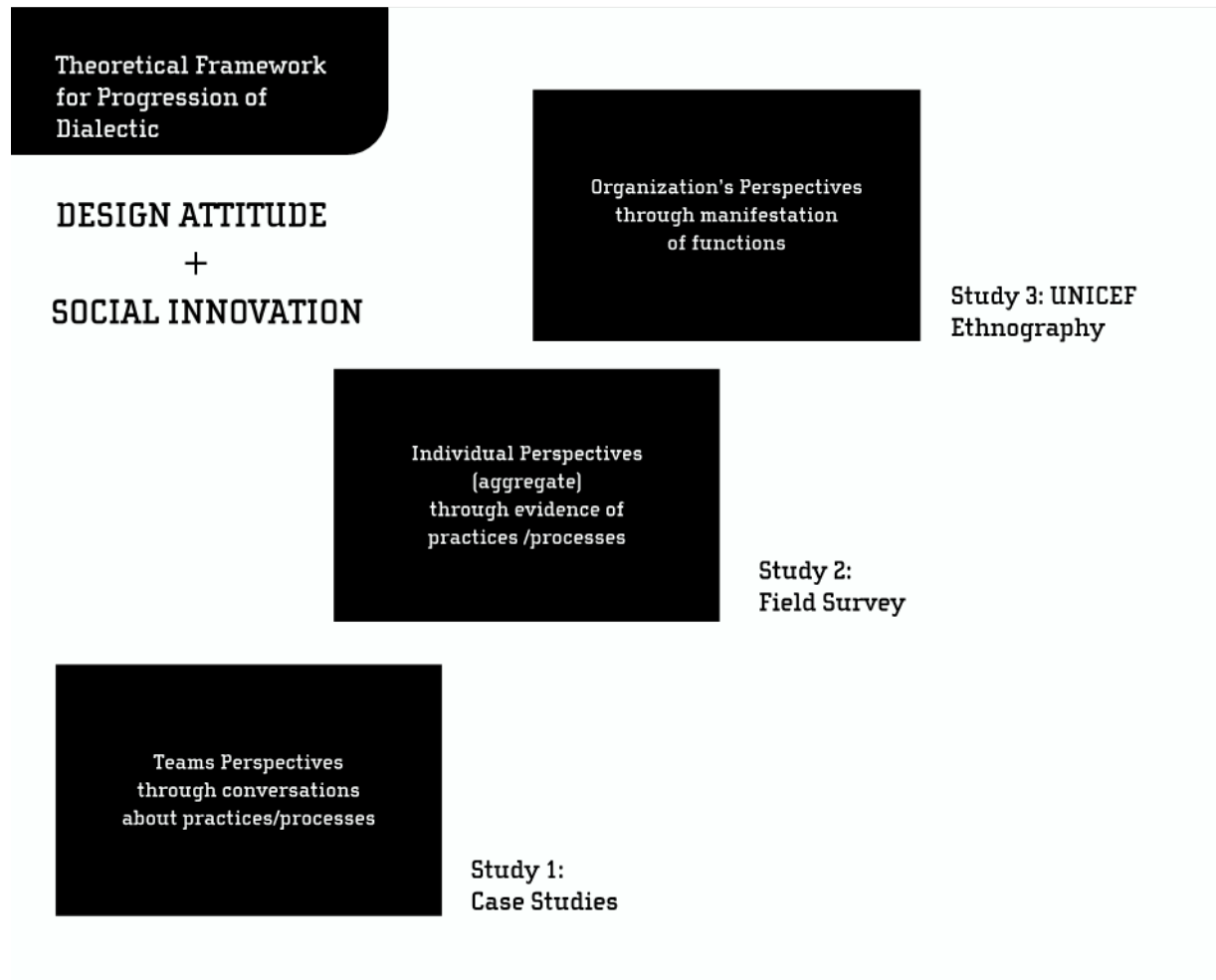
relevance to the arc of inquiry of the dissertation, as I moved from the particulars of design attitude in the context of social innovation in chapters 1 and 2, to a more encompassing sense of whole of how design attitude manifests in an organizational context in chapter 3. Institutional logics can be defined as *taken- for-granted social prescriptions that represent shared understandings of what constitutes legitimate goals and how they may be pursued* (Battilana & Dorado, 2010). In this sense, institutional logics guide actors' behavior in organizational fields of activity (Battilana & Dorado, 2010; DiMaggio & Powell, 1991; Ocasio, 1997; Suddaby & Greenwood, 2005; Thornton & Ocasio, 2008). The concept is further defined as *the socially constructed, historical patterns of material practices, assumptions, values, beliefs and rules by which individuals produce and reproduce their material substance, organize time and space, and provide meaning to their experiences and social reality* (Thornton & Ocasio, 1999). Importantly, this expanded definition links the notions of individual agency and cognition of institutional actors with socially constructed institutional practices and rule structures. The definition thereby integrates the structural, normative and symbolic forces of institutions as complementary dimensions (Thornton & Ocasio, 2008). In this regard, the multi-dimensional character of this institutional logics definition also aligns well with my treatment of organizational culture as a root metaphor for understanding organizational life.

Theoretical Framework

The literature and theories of design and social innovation that I reviewed above informed the theoretical frameworks and conceptual models for the study's three phases, with streams of organizational culture and institutional logics of the literature being ones

that I explored in the last phase of the research. The design attitude stream emerged as of importance in the second and third phases (chapters 2 and 3) of my research, as I progressed in the inquiry. The concept has become core to this dissertation overall as it has allowed me to deepen my characterization of design, moving from concepts of design for social innovation in the literature of design thinking that often tend to emphasize cognitive and “toolkit” aspects of design’s contributions to social innovation (procedural method that designers and managers can follow to explore problem-solving, with replicable steps that focus on human-centered processes of discovery—with desirability, viability, and feasibility being a focal triad of notions (Brown, 2009)), to a more holistic understanding of design. Figure 2 illustrates the progression of the inquiry throughout the three chapters of the dissertation in an overarching theoretical framework that guided the study, founded on the two core constructs of the inquiry: design attitude and social innovation.

Figure 2: Theoretical Framework for Progression of Dialectic



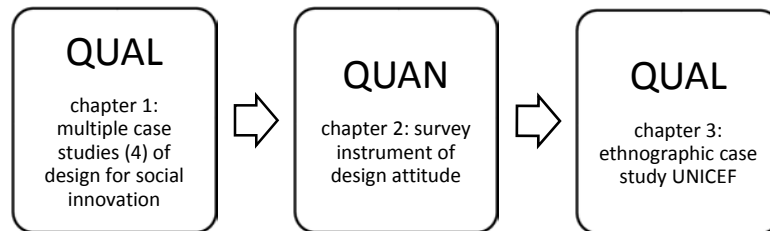
Research Methodology

This section of this introductory chapter presents the research design of the dissertation and the rationale behind the selection and sequence of methods that I use to explore matters of theory and practice that pertain to each of the dissertation's three empirical studies. I explain how each study builds upon one another in an exploratory sequential order through the three main phases of the inquiry. I then summarize the studies' research questions, and finally I discuss the dialectical progression that underpins the choice of methods in the inquiry overall.

Research Design Sequence

By definition a research design is the arrangement of the conditions for the collection and analysis of data in a manner that reveals a strategy of inquiry that is relevant to the research purpose. This dissertation is organized as a sequential mixed methods exploratory study, carried over three inter-connected phases structured with two qualitative studies that book-end the dissertation—chapters 1 and 3—and a central quantitative study, chapter 2 (Creswell, Plano Clark, Gutmann, & Hanson, 2003). The perspectives and findings of each empirical study build upon one-another, informing the subsequent phases of research design; I represent the sequence using the notation proposed by Morse (2003) in which capital letters signify the equivalent weight of attention I gave to each method, and the arrows connote sequence, as follows: QUAL→QUAN; QUAN→QUAL. Figure 3 illustrates the multi-phase sequential exploratory research design of the dissertation and its corresponding chapters.

Figure 3: Mixed Methods Sequential Exploratory Research Design of the Dissertation



Why Design Methods? A Definition and Rationale

A highly cited and accepted definition of mixed methods research, which I adhere to in this inquiry, posits that it is a type of research in which the researcher combines elements of qualitative and quantitative research approaches (e.g. use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) in one single study for the purposes of breadth and depth of understanding and corroboration (Johnson, Onwuegbuzie, & Turner, 2007). Importantly, in addition to being a method of inquiry, mixed methods is also a research design that involves the worldview of the researcher and his/her philosophical assumptions which guide the direction of the collection and analysis of the data and the sequence and mixture of qualitative and quantitative approaches in many phases of the research process (Creswell & Clark, 2007). In this regard I brought to my inquiry a very rich personal perspective and many years of prior expertise as a design educator and practitioner deeply steeped in similar circumstances than those that I studied—situations where the agency of design to drive social innovation outcomes was the central objective of design teams. This familiarity with the problem of practice also meant that I had privileged access to expansive networks of

individuals and organizations willing to participate in my research. These factors influenced positively the progression of my research design and facilitated the successful collection of the rich data sets that form the backbone of this dissertation's empirical studies.

A key purpose of the mixed methods research design in this dissertation is fresh theory generation as well as the validation of existing theories in the design and social innovation discipline domains. Since the field of study is characterized by its undisputable emergent nature (Williams, 1977), the choice of mixed methods, which is commonly used for studies that aim to stimulate a researcher to define and analyze innovative problems and research questions better (Azorín & Cameron, 2010), allowed me to contribute detailed integrated and contextualized insights and make new inferences about the plausible value that a design attitude approach and design practices may offer to social innovation. From a methods perspective, there are three main imperatives in the research design that justified the mixed methods approach: 1) ensuring that each phase of the data collection of the three empirical studies conducted was designed to direct the theoretical drive of the inquiry forward (this consideration is also connected to the dialectal progression of the inquiry that I discuss further below); 2) demonstrating successfully and building veracity for the validity of my claims with the opportunity to have triangulation (i.e. crosschecking findings from one method against the results deriving from another type, and examining different facets of phenomena); and 3) tying the research questions of each study with theoretical and practical significance (Azorín & Cameron, 2010). In this sense, a primary advantage of the combination of methods in this study is that it facilitated—better than any single method could have (Tashakkori &

Teddlie, 2010)—a twofold objective of this dissertation’s purpose: discovery and explanation of phenomena. In the two qualitative studies that bookmark the dissertation: chapter 1 (the four cases of design for social innovation projects), and chapter 3, (the UNICEF ethnographic case) my aim was to explore and make sense of the nature and complexity of the processes and range of situations that characterize those studies, honoring the pluralism of the perspectives and viewpoints of the participants, and capturing the richness of the cultural circumstances and organizational context that defines these fluid practices. In chapter 2 (the survey on design attitude), I chose a quantitative method with the development of a survey instrument to understand, confirm and verify the relationships between variables that were critical in operationalizing the first order dimensions of several of my key constructs (design attitude, social innovation and user participation), in order to then test hypotheses and measure the predictive validity of the key independent variables in my study (i.e. design attitude, user participation, prototyping and visualization) in the social innovation context. My embracing of both the qualitative and quantitative methods was predicated by a belief that these methods should not be viewed as competitors, but as complementary to the objectives of the inquiry (Jick, 1979).

Summary of the Three Empirical Studies and Research Questions

Taken together, the research questions of the three empirical studies were both exploratory (for chapters 1 and 3) and confirmatory (for chapter 2) in nature. The methods utilized and the rationale behind them as well as their respective research questions with salient findings that informed each subsequent phase of the investigation are briefly summarized in the subsection that follows and shown in Table 2.

Chapter 1: Design for Social Change: Consequential Shifts in the Designer's Role

As already stated, the importance of the research problem and questions is a key principle of mixed methods research design (Creswell & Clark, 2007). For the initial study, my objective was to put forth broad, open-ended research questions that would allow me to elicit meaning and develop empirical knowledge about design, and designers' modes of problem solving in the social innovation context. Not surprisingly, I did not have at this stage of my research a sufficient sense of a conceptualization of design to integrate the construct of design attitude into my research questions. Therefore the research questions that I posed in this first phase of inquiry were the following:

- 1) What are the influential factors that define the role of the designer in the social sector?***
- 2) In particular, what is the experience and meaning of doing social sector design projects in the high and low conditions of difference, dependence and novelty within the context of a multidisciplinary and co-creation framework?***

I combined a grounded theory approach recommended by Strauss and Corbin (1990) with case study methodology and a comparative semantic analysis of the four cases sampled in this initial study. The grounded theory approach was conducive to the goals of this study: identifying a pluralism of design practices, methods, and principles that characterized designer's approaches to social innovation, in situations that are often demanding an expansion and/or redefinition of designers' roles and responsibilities in interdisciplinary teams across a variety of organizational contexts and geographies. Grounded theory provides well-established means of systematically collecting and analyzing data from the field to understand complex psychological and sociological

phenomena and construct theories “grounded” in the qualitative data itself. I approached this initial investigation in the dissertation in full “discovery” mode: my objective in designing this first phase of the inquiry was to gain a “baseline” sense of these emergent practices. The multiple case selection I pursued was critical to ensure better grounded, more accurate and generalizable theory (Yin, 2014). Hence, my strategy was to follow a deliberate sampling plan, choosing extreme cases that represented “polar types” which made more evident the detection of significant patterns (Eisenhardt, 1989). All four cases involved complex projects that had a social innovation aim (Mind Lab’s *Branchekode*, the former Helsinki Lab *Designer’s Exchange*², Frog Design *Project Mwana* and ideo.org *Clean Team*) in which designers were working within varying degrees of interdependency with managers. In addition, I was interested in comparing and contrasting cases that presented different organizational structures. I chose to examine examples where the design attitude capability was embedded in the organization (i.e. the design teams of Mind Lab and Helsinki Design Lab were part of Scandinavian government structures) versus situations where design attitude capabilities were brought in as an external resource (i.e. ideo.org and Frog Design are both global consultancies that were engaged in this manner in the cases studied). Data collection took place from February until June 2012. In all cases and across the 28 semi-structured interviews conducted, I examined both the perspectives of designers and their clients or partners to gain evidence of design attitude from multiple and divergent viewpoints through constant comparison (Glaser & Strauss, 2009; Strauss & Corbin, 1990). My analytical approach

² The Helsinki Design Lab is referred to as “former” because the studio, which was embedded in the Finnish Ministry of Innovation Sitra, closed its doors in summer 2013, after I had completed research on the case in 2012. A full archive of their projects and publications is available at <http://www.helsinkidesignlab.org>.

was characterized by the cyclical nature of coding (a process of distilling data, and sorting it to uncover patterns in the frequencies of the segments of words and phrases from the interviews, and then generating thematic and theoretical categories from this iterative procedure). Throughout the semantic analysis, the goal was to embrace an approach of “systematic pluralism” as an avenue to inquiry in the philosophical tradition of McKeon; seeking to be aware of, and gain insight from the “*terministic screens*” (Burke, 1966) that interviewees revealed, i.e., the ingrained communication symbols and filters that form a grid of intelligibility and mediate one’s experience of the natural and human-made world. In particular, with the semantic analysis, I not only used a binary frame (designers versus clients) but also included three key categories to study the language used: 1) values and goals of the project at hand; 2) descriptions of activities and methods used in the project; and 3) descriptions of the context and situation that characterized the activities of the project. This strategy allowed me to tease out differences and commonalities, and it ultimately revealed the most salient and generalizable finding of this initial phase of inquiry: the concern by all interviewees to identify with more clarity the unique value design offered in this social innovation context of practice, what I refer to as “the return on design” (ROD).

Chapter 2: Explaining the Effects of Design Attitude on Team Learning, Process Satisfaction and Social Innovation Outcomes

The second phase of the research was a quantitative study informed by the findings of the first study (chapter 1), and particularly by the central concern to demonstrate “the return on design” through unique methods, practices and approaches to problem solving and innovating to support positive social change. In order to test with

precision hypotheses that would advance my empirical and theoretical understanding of design in the field of social innovation, I identified the design attitude construct in the literature as a plausible effective conceptualization to advance the inquiry forward with quantitative methods. I also set out to test relationships among other variables that seemed important in the first study for the possibility they would account for particular impact in this context (i.e. techniques such as prototyping and visualization, practices such as co-designing with users through user-participation). Thus, the three research questions that guided the inquiry in this chapter sought to address the following:

- 1) What are the key dimensions of design attitude and how are they related?***
- 2) Does design attitude relate significantly to social innovation outcomes, process satisfaction and team learning?***
- 3) Do prototyping, visualization and user participation impact social innovation outcomes, process satisfaction, and team learning in the context of high or low design attitude?***

The study used factor analysis, structural equation modeling, and survey methodology to identify relationships and test the strength and generalizability of the factors that surfaced in the first study as important to design teams in the context of social innovation projects. Data for the survey instrument was collected over a period of three months (from February 2014 until the end of April 2014). The sampling strategy (the data set was parceled and resulted in 233 fully completed questionnaires and 370 completed questionnaires for the section of the instrument pertaining to design attitude questions) consisted of administering the survey nation-wide with the endorsement of the professional design association (AIGA) and via the researcher's extensive and diverse

international network of design educators, project managers and practitioners who have expertise in design for social innovation projects. Organizations and networks that participated in and/or promoted the dissemination of the survey instrument included the Design Management Institute (DMI), the international Cumulus Association of Universities and Colleges of Art, Design and Media, the Design Studies Forum List, and the Autodesk Social Impact Design Foundation, among others.

Given the paucity of quantitative research and analysis in the domain of design, and in order to develop a rigorous survey instrument, a chief aim of this study was to create psychometric scales for the instrument through rigorous construct conceptualization (MacKenzie, 2003; MacKenzie, Podsakoff, & Podsakoff, 2011). This represented considerable effort due to the lack of prior studies in the research domain (design attitude had only been investigated from a theoretical and qualitative empirical research basis in the literature, and never in the context of social innovation³) and required the operationalization of design attitude, as a formative, second-order construct. I tested six observable dimensions (traits) of design attitude: 1) ambiguity tolerance; 2) engagement with aesthetics; 3) systems thinking; 4) connecting multiple perspectives; 5) creativity; and 6) empathy (the study confirmed all dimensions except for systems thinking which had not been validated in the prior empirical work of design attitude). These dimensions, in turn, allowed me to specify carefully the construct domain for

³ It is important to nuance this statement by recognizing that Kamil Michlewski developed a survey instrument deployed in November/ December 2014 that included scales for design attitude based on his empirical conceptualization of design attitude from (2008). Because the instrument is at this writing yet to be rigorously validated, I only adapted components of it with caution in my study. See chapter 2 for further detail.

design attitude, articulate scales for each of its dimensions, sample from potential items pools, develop item battery and validate their measurement properties.

The survey instrument treated design attitude as an individual perception of designers and project managers who are regularly engaged with design for social innovation initiatives, and therefore the sample was by and large constituted by what we would consider individuals exhibiting high design attitude fluency (design fluency was a control in this study). The new psychometric scales for design attitude that I put forth operationalize the concept of design attitude in measurable terms for the first time in the literature. I was able to validate the scales and the construct using well established statistical methods to establish construct validity (MacKenzie et al., 2011). The newly operationalized construct of design attitude was then introduced in a measurement model that included key design techniques (prototyping and visualization) and practices (user participation in the design process), and linked design attitude to process satisfaction, team learning, and social innovation project outcomes in accounting for observed impact.

By departing from the past qualitative-based studies in the literature that have wrestled with the elusive impact of designers' modes of engagement in the field of social innovation, the study showed very robust statistical results (positive and significant relationships) that demonstrate a very high explanatory power of design attitude on social innovation project outcomes, team learning and process satisfaction. By establishing the nomological and predictive validity of the design attitude construct, this second study in the dissertation provides new insights into design behaviors that influence social innovation processes.

Chapter 3: Innovation by Design at UNICEF: An Ethnographic Case Study

The third and final phase of the research utilized again qualitative methods with an ethnographic case study of the global Innovation Unit at UNICEF. The Innovation Unit's mission within the larger organizational structure of UNICEF and its integration of design principles and practices to execute the innovation mandate of the organization overall presented an ideal context to probe further the manifestation of design attitude capabilities and behaviors that we had operationalized successfully in our quantitative study. Two primary research questions guided this study:

- 1) How does design attitude and its dimensions manifest within projects undertaken by the unit and the organization at large?***
- 2) How can we relate the manifestation of salient design attitude dimensions to the processes of innovation underway?***

My purpose in this study was to generate actionable theory that could reveal the relationships of design practices and design attitude capabilities to collective human agency and innovation at the organizational level. As a practitioner, I had collaborated with the Co-Founders and Co-Leads of the Innovation Unit almost since their establishing of their programs at UNICEF Headquarters; this familiarity with the goals of their work and our prior collaboration was a fundamental starting point for the access to high level informants that I was granted to conduct this ethnography over a period of eight months (from June 2014 until January 2015). The study included data collected from twenty-one semi-structured interviews with Innovation unit members as well as key leadership from UNICEF at large; nonparticipant observation field notes, and insights from my shadowing key members of the team over a period of four months, as they

prepared for a new “flagship” product deployment (the SMS communication platform called “RapidPro”). The primary objective for this qualitative approach in this final phase of my mixed methods study was to gain density of information as well as depth and clarity of meaning by studying design attitude in the macro-level organizational setting of UNICEF. The exploration of the cultural milieu of the Innovation unit of UNICEF also aimed at creating a space for deliberation, bringing different kinds of systems into view (Fortun, 2012) by relying on rich detailed descriptions in the narrative and by relaying accounts of key incidents or perspectives shared by my informants. In this sense, I pursued data collection as a means to construct generative theorizing from the perspective of not simply an observer or full participant, but from that of a facilitator; paramount to my research aims was to drive forth new meaning of the phenomena under examination and give voice to informants by maintaining a high degree of reflexivity about the asymmetries that occur between observer and observed (Fortun, 2012; Golden-Biddle & Locke, 1993, 2007), as well as the subjectivity that arise from personal biases.

My objective in assembling the narrative of the findings from this study was to achieve a rigorous partiality and an economy of truth about design attitude manifestations in this innovation context (Clifford & Marcus, 1986) over a comprehensive account. The key findings of this study portray design attitude manifestations amid the richness and complexity of an organizational context where institutional logics and cultural norms at the macro-organizational level are interdependent with micro-level considerations of organizational actors seeking to advance the innovation mandate of the organization as a whole.

I illustrate with a flow chart the procedures and key points of integration of the methods just discussed above in Table 3. Detailed descriptions of methods and analyses utilized in each of the three studies are provided in the full reports on each respective study (chapters 1, 2, and 3).

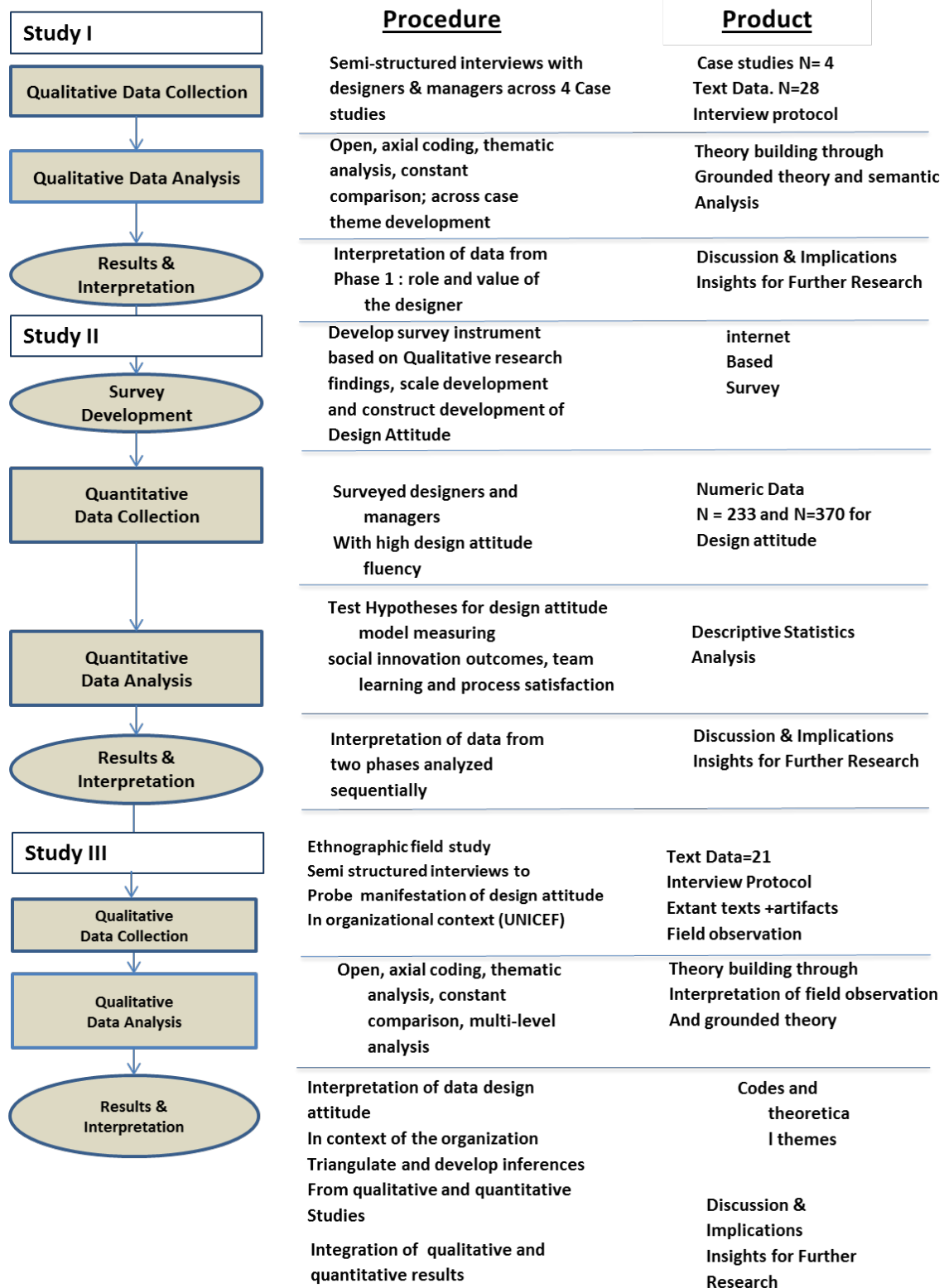
Table 3: Integration of Research Questions, Theory, and Mixed Methods Research Design and Analysis

Phase 1		
Research Questions	Theoretical Background	Research Design (Methods & Analysis)
1) What are the influential factors that define the role of the designer in the social sector?	Design and Social Innovation Theories	Qualitative study of 4 design firms with teams of high design fluency practicing in the social innovation context.
2) In particular, what is the experience and meaning of doing social sector design projects in the high and low conditions of difference, dependence and novelty within the context of a multidisciplinary and co-creation framework?	Grounded theory	Use of case study and semantic analysis 28 phenomenological, semi-structured interviews with designers that worked in each project along with interviews of “non-designers” (managers and clients who commissioned the projects). Data collection February-end of June 2012. Counting of frequency and patterns of words that emerge from the conversations in the interviews with designers and non-designers. Open and axial coding, constant comparison, and thematic analysis to compare and contrast experiences of designers and non-designers.

Phase 2		
Research Questions	Theoretical Background	Research Design (Methods & Analysis)
1) What are the key dimensions of design attitude and how are they related? 2) Does design attitude relate significantly to social innovation outcomes, process satisfaction and team learning? 3) Do prototyping, visualization and user participation impact social innovation outcomes, process satisfaction, and team learning in the context of high or low design attitude?	Design, design attitude and Social innovation theories Team learning Process satisfaction User-participation	Quantitative study: Design and validation of a new instrument to measure design attitude and other key constructs that may impact social innovation outcomes, team learning and process satisfaction. Data collection February – end of April 2013. 233 completed surveys of designers and managers with a high fluency of design attitude. Larger sample secured of surveys for design attitude: 370 surveys Results of qualitative study and existing theory informed development of survey instrument, hypotheses, and conceptual structural equation model (SEM). Exploratory and confirmatory factor analyses in SPSS and AMOS to create measurement model using entire data set of 233 respondents for the whole survey and 370 for responses on design attitude. Results of SEM analysis used to evaluate hypotheses.

Phase 3		
Research Questions	Theoretical Background	Research Design (Methods & Analysis)
1) How does design attitude and its dimensions manifest within projects undertaken by the unit and the organization at large? 2) How can we relate the manifestation of salient design attitude dimensions to the processes of innovation underway	Design, Design attitude theories Organizational culture Institutional logics Grounded theory	Ethnographic study of the Innovation Unit of UNICEF. Data collection June 2014-January 2015. Analysis included 21 semi-structured interviews; fieldwork consisted of observation at UNICEF Headquarters as well the shadowing of innovation team on the RapidPro initiative and analysis of extant texts and documents as well as informal interviews of Innovation team.

Figure 4: Diagram of Mixed Methods Research Design Sequence, Aims & Outcomes



Dialectical Reasoning as a Strategy of Inquiry

As has been stated by many method scholars from different philosophical orientations, in different ways, over time (Charmaz, 2014; Creswell et al., 2003; Glaser & Strauss, 1967; MacKenzie, 2003; Pratt, 2009), all methods are merely tools, and how we use methods as researchers to ensure that they do not become mechanistic applications that yield mundane data, matters. The exploratory mixed-methods sequence that I followed to interpret the empirical situations encountered in the three phases of research that I summarized above was aimed at helping me take on a reflexive stance that would deepen knowledge about the problem of practice at hand—design attitude in the context of social innovation. As a researcher, I wrestled with the seeming contradictions, and the push and pull of translating and interpreting phenomena from the qualitative to the quantitative, back and forth, in the inquiry (Bergson, 1971), and it was only when I reached the end of the exploratory mixed-methods sequence that I selected—QUAL->QUAN; QUAN->QUAL—that I came to understand the significance of the numerical properties of the variables I measured in the second study, and how these in turn expressed meaning and insights through the networks of relations they were part of: both in terms of the relationships that I hypothesized and tested in the measurement model of that study, as well as with regard to the translation of these mathematical results onto the context of the subsequent study of UNICEF. In the latter, my observations and interpretations of the manifestation of some of these variables and the statistical significance of their relationships in the prior study were now embodied in time and space, and elicited new meaning about how they functioned amid the whole and the web of human relationships that were enacted in the organization itself (Bergson, 1971;

Buchanan, 1929, reprint 1962). Thus, in many ways, the choice of methods and the place of the qualitative and the quantitative in my research progression can be considered as substantive as the subject matter of the research itself—design attitude and social innovation. In other words, my adopting mixed methods was not only part of an attempt to answer my research questions with ingenuity and incisiveness (Charmaz, 2014), but also represents a progression that fundamentally relates to a deeper rationale that drives my strategy of inquiry in this dissertation—a method of dialectical reasoning to move from an understanding of parts or fragments of knowledge to a larger whole. In this subsection I elaborate on the significance of the “skeptical dialectic” strategy of inquiry that I pursue for elucidation with regard to the subject matter of this dissertation. I start by reviewing briefly the features of the two distinctive ancient traditions that established it as method “to define terms, clarify minds and discover truths about things,” (Buchanan, 2001a). I then proceed to define my usage, and I end by presenting a visualization of the dialectical progression of my inquiry as a theoretical framework.

There are many varieties and historical meanings associated with the term “dialectic” (Buchanan; Buchanan, 2001a; McKeon, 1954; Perelman, 1969; Spranzi, 2011). A comprehensive review of this literature is outside the scope of this inquiry; however, it is worth touching briefly on a few foundational and “formal” definitions of the term, at the risk of oversimplifying somewhat, in order to help explain my use of the method for the purposes of this inquiry. If we go back to the original Greek meaning, “*dialektikē*,” the term is related to the verb “*dialegein*”—literally “to talk across” (Spranzi, 2011). Hence, from this etymology and the first usages, dialectic can be understood as the art of discussion and dialogue. Plato, who represents one of two

important ancient traditions of dialectic (the other being Aristotle) saw in the dialectician the individual whose mastery would emerge from knowing to question and to answer, demonstrating a critical spirit in pertinent questioning to advance his thesis and refute the objections of his questioner (Perelman, 1969). According to Plato, dialectic is part of a practice that engages our reasoning through provisional premises in which we gradually achieve higher knowledge and an approximation of the truth that can then be tested through normative exchanges in dialogue. In this tradition, terms change meaning in the course of the argument and may be ambiguous; contradictions are resolved by preserving what is essential to both of the contradictories; and principles function to provide an ontologically higher or a historically later truth (Buchanan, 2001a). Aristotle's treatise on the art of dialectic, *Topics*, advanced how we might consider the relationship between structured debate and knowledge by positioning dialectic as an important strategy of inquiry: "being of the nature of an examination, [dialectic] lies along the path to all principles of methods of inquiry" (Spranzi, 2011). For Aristotle, dialectic provides means by which "to speculate about contraries without knowledge of essence," and thus relates dialectic as an art of discovery and a calculation of probabilities and opinions (McKeon, 1954). In his tradition, dialectic employs "common places" or "topics" to relate meanings attached to words, and arguments attached to things, and define terms univocally; contradictions are resolved by retaining the true or probable and discarding the false proposition from the pair of contradictories; and principles serve the function of relating to arguments which proceed by inclusion and exclusion (Buchanan, 2001a). Among the key features of the method of dialectic that both traditions emphasize are: 1) the importance of conversation or dialogue; 2) the necessity to address opposites or

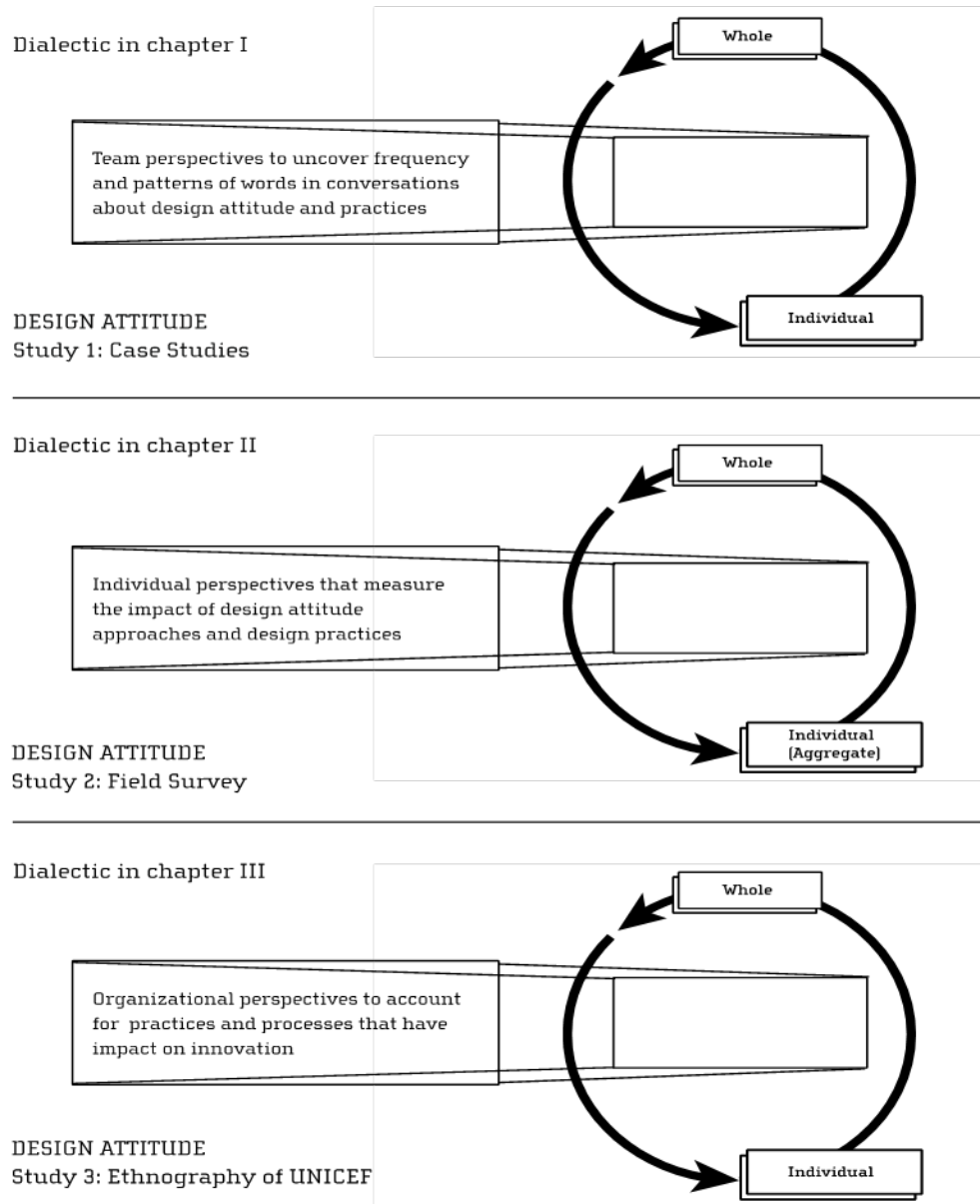
contradictions; 3) the possibility to recognize ambiguity and metaphor in argument; 4) the concern with definitions; and 5) a focus on a process of becoming.

In this dissertation, I embrace these features of the method and I consider dialectic following the definition of the British philosopher R.G. Collingwood as “*a method of thinking by question and answer for the purpose of bringing hypotheses to light*” (Collingwood, 1998). My use of the “skeptical” variety of dialectic connotes that I follow a tradition also referred to as “pragmatic, suspensive or constructive dialectic” (Buchanan, 2001a), a kind of dialectic that is fundamentally about a suspension of judgment and probability, and adheres to the position that terms change their meanings in the course of arguments and as inquiry progresses (McKeon, 1954). Hence, my objective in adopting dialect as an art of reasoning is appropriate for the emergent field of design attitude and social innovation that this dissertation touches upon since dialectic also holds that the object of study cannot be understood as self-contained and self-sufficient (Hargraves, 2012). With each empirical study, I dwell on the shifting perspectives that emerge from my data, treating these perspectives as probabilities through asking questions, and progressively seeking to unfold layers of meaning from the insights that emerge in the process of exploration and explanation that I take on. In a seminal essay, “Dialect and Political Thought and Action,” (McKeon, 1954) the philosopher Richard McKeon referred to one of dialectic’s strengths being its attention to revealing the nature of things gradually through “the process of dividing and collecting, cutting things into classes where the natural joints are.” He also reflected on the historical revival of the skeptical tradition of dialectic by Kant in the 19th century as a “cathartic of understanding.” One can view the progression of inquiry in the three chapters of this

dissertation both with that atomistic image that one can infer from the first statement, and the actionable one that the second reference invites.

Figure 5 illustrates the dialectical progression of the dissertation's three chapters and the shifting perspectives on design attitude and social innovation that emerge. Each circular diagram is drawn to convey a progression that starts from the individual/particular sense of the whole that then informs the particulars back again. In the first empirical qualitative study, the perspectives that I capture represent initial insights about practices and processes of design (and design attitude) that I cull from my conversations and interviews where I count the frequency of words and look for significant patterns via semantic analyses. In the second quantitative empirical study, I gather a more comprehensive set of meanings from the aggregate of individuals' perspectives that I collect and analyze in the field survey about the impact of design attitude in social innovation. Finally, in the last empirical study, the ethnography of UNICEF, the perspectives that I collect shift meaning and advance my understanding to an approximation of a larger whole, as I start to trace how design attitude capabilities function in the organization.

Figure 5: Progression of Dialectic



Prelude to Chapter 1

"The truth starts with two."

— *Karl Jaspers, Way to Wisdom (1951)*

There is an element of buoyancy that conversation brings forth when it is connected to a process of research that takes a life of its own and leads to new insights. This initial chapter is the result of many such conversations that I participated in with designers and non-designers. These were situations where I had to refer back and forward to what was said in order to uncover meaning and, eventually, identify the significant particulars that advanced this inquiry in a foundational way.

CHAPTER 1: DESIGN FOR SOCIAL CHANGE: CONSEQUENTIAL SHIFTS IN THE DESIGNER'S ROLE⁴

Introduction

One could easily argue that everything around us is the result of a design decision. In their most essential roles, designers deal with concrete and objective results whose consequences affect us all, shaping the form, function and symbols of our world: from the visualization, ideation and planning of images, products and services to the strategic conceptualization of systems and environments (Buchanan, 1995).

Concurrently, the non-ergodic forces that define our globalized economies, and the growth in complexity and uncertainty that characterizes our 21st century society, urgently call for new pathways to social innovation and intervention without prescribed courses of action. The unified framework for development put forth by the United Nations Millennium Development Goals (United Nations, 2000) illustrates many of the intractable challenges we confront today as a global society. The eight development goals include systemic issues such as eradicating extreme poverty and hunger, and reaching environmental sustainability. They are comprised of health-based objectives such as reducing childhood mortality, improving maternal health, containing HIV/AIDS, malaria and other diseases, and touch upon human rights markers such as promoting gender equity, the empowerment of women and achieving universal primary education. In the developed-economies context, the list of pressing social problems may be somewhat different, but is equally complex: ensuring access to healthcare and education across socioeconomic strata, caring for an aging population, balancing policies for immigration

⁴ Qualitative Research Report, January, 2013

and diversity, countering unemployment, striving for income equality, fostering participation and transparency in governance, addressing climate change, and so on.

In this context, a revolutionary transformation is underway in the design field as it continues to expand its meaning, shape human experience and influence other knowledge domains and culture at a broader scope than ever before (Buchanan, 1995). This contemporary view of design not only encompasses the traditional alliance of design with market-based considerations and consumer culture, but also accounts for design as a locus for public and social innovation: design intended as a combination of ways of thinking, knowledge and skills to be applied to the most diverse kind of artifacts, provision of services, communication, organizations and policies (Manzini, 2012). Increasingly, designers are facing these open-ended challenges head-on, and are called upon as uniquely effective translators and synthesizers of this class of societal problems that are not neatly bounded, but ill defined, ill structured and “wicked” (Rittel & Webber, 1973).

Research Question

This study addresses some of the key implications that emerge for the professional design field as it orients itself to a more general expanded set of practices that include an agenda for societal change and human progress. Specifically, the focus is placed in the examination of consequential shifts that are occurring for the role of the designer as a change agent (Margolin, 2007) when engaged in projects that have a participatory, user-centered design framework (Ehn, 2008; Manzini, 2011) in the “public sector” (which is the area of the economy concerned with providing various government services) and more broadly, in the social innovation context (which is characterized by

innovations that are applied to multiple societal challenges and involve multiple actors across sectors and disciplines). The research question is: what are the influential factors that define the role of the designer in the social innovation context?

In particular, what is the experience and meaning of doing public and social innovation design projects in the high and low conditions of difference, dependence and novelty (Van de Ven, 2007) within the context of a multidisciplinary and co-creation framework?

For the purposes of this investigation, the case studies examined include projects addressing human needs linked to large-scale social, cultural and economic challenges. The cases are *Clean Team*, a sanitation business currently being trialed in Kumasi, Ghana, the result of a collaboration among Unilever, Water and Sanitation for the Urban Poor (WSUP) and the social innovation arm of the design firm IDEO, IDEO.org; *Project Mwana*, a mobile health (mHealth) service that uses mobile phones to improve early infant diagnosis of HIV and postnatal follow-up and care in rural settings that is a collaboration among UNICEF, Frog Design and partners within the governments of Zambia and Malawi; *Branchekode.dk*, a Danish cross-ministerial initiative in partnership with the Danish government's design-based innovation incubator Mindlab that is centered around a digital platform for business owners to find and register their business with the appropriate industry code that regulation demands; and, finally, the *Design Exchange Program (DEP)*, an initiative of Helsinki Design Lab and the Finnish Innovation Fund, Sitra, that embeds designers in ministry and city-level positions in Finland.

To arrive at new insights, 28 semi-structured interviews were conducted with a broad range of participants, including a cross-section of designers, consultants, clients, funders and project managers in the companies, government, and international development organizations that are stakeholders in the four projects at hand. The data collected points to a plurality of views about the range of actions that designers are responsible for today within the complex organizational boundaries they traverse. The study also reveals, in part, a profound state of flux in terms of the roles designers are espousing within the knowledge communities they interface in this social innovation context. In particular and to a great extent, the study showcases how these modalities of strategic design engagement in the social innovation context remains work that is still “at the edges.” The study’s findings have implications for both the growing field of design studies and for design practitioners, managers and social innovators alike.

Literature Review

A comprehensive overview of the literature from the design methods movement of the 1960s greatly informed the foundational research of this study. Furthermore, an examination of philosophical semantics and dialectical and rhetorical modes of inquiry presented by design as a discourse and activity deeply rooted in the humanities provided a seminal framework. Here, the process was guided by the writing of Richard McKeon, John Dewey and Richard Buchanan, and grounded the interpretation of salient issues emerging from the data that pertain to the collaborative and complex human dynamics of these four case studies. Three key theoretical frameworks in the history of the design science field—that of Herbert Rittel, Herbert Simon and Donald A. Schön—informed the study’s discussion about the nature of design ability and the implications of it in

understanding the designer's role. Finally, key contemporary theories that are defining the domain of participatory design research and practice (Elizabeth Sanders, Ezio Manzini and Pelle Ehn) as applied to social innovation offered an important lens, especially when juxtaposed with 20th century theories of human development (Sen, 1999) and sociological theories of structuration (Giddens, 1979).

Design Methods

A major area of design research is methodology, the study of the processes of design, and the development and application of techniques that inform the design process. Herbert Rittel's articulation of the unique "reasoning of designers," which sets forth a natural human design ability keenly grounded in community (Rittel, 1987) provides important conceptual scaffolding. Three others who have contributed to the foundational literature about design methods in the 20th century are Bruce Archer, Christopher Alexander and John Christopher Jones.

British designer Jones's essay "A Method of Systematic Design" (1963) and his influential book *Design Methods* (1970) set forth a strategy of rhetorical inquiry that sought to integrate both rationality and intuition in a unified system of design that articulated design arguments and solutions supported by creative imagination. Jones's *Methods* is an important compendium of ideas that provide insight on his key concern: to elucidate how design can be better and more responsive to a user's needs. The three-stage process that he describes in Chapter 5 of *Methods*—comprising Divergence, Transformation and Convergence—provides us with an important framework. Jones's subsequent texts *Essays in Design* (1984) and *Designing designing* (1991) also offer an

impactful articulation of the uncertainty and element of surprise that represent important criteria in the process of designing for complexity in the social sector.

Bruce Archer's "Systematic Method for Designers" (1965) focuses on the *act of designing* and the actions of the designer within a systems approach in the context of a broad set of materials and processes of production in the postindustrial age. As Richard Buchanan cites in his dictionary entry of *Thinking About Design: An Historical Perspective* (2009: 433), Archer outlined a process that includes 1) the prescription of a model—the genesis of the design idea at its formulation stage; 2) the intention to embody the model with specific means and materials depending on the situation; 3) the synthesis and the form of the solution—which may include a “creative leap” or a calculation process to arrive at it; and 4) the definition of the specific problem, which is the goal or purpose of the design. Archer divides the systematic process of design into three phases of action: analytic (which for Archer is inductive), creative (this is an heuristic stage where the creative leap comes in) and executive. Archer's belief in the “transience of design” and the value of creative action is of special relevance.

Finally, Christopher Alexander's strategy of dialectic for approaching problems in his seminal *Notes on the Synthesis of Form* (1964) is aligned with Plato's and sets forth the process of analysis and synthesis as part of an integrated whole where *context*, as a field of constraints and demands, and *statement of need* for what must be designed become paramount considerations.

Collaboration as a Dialectical Process

Richard McKeon's contributions imbue this study with an important conceptual framework, offered in his essay "Philosophic Semantics and Philosophic Inquiry."

McKeon lays a set of principles that govern discourse and reflective inquiry:

"Communication and presentation depend on unambiguous definition in basic statements and on consequential consistency in discursively related statements; discussion and inquiry depend on productive ambiguity in the interpretation of common problems and suggestive inconsistency in the assumptions proposed to resolve them."

This statement especially resonates when one considers the designer's role and the process of designing as a contemporary form of rhetoric that incites action through argument (DiSalvo, 2012) and engages the emergence of pluralism as "a recognized feature of human circumstances" (Buchanan, 1995). The interdependencies McKeon draws for the schema of philosophic semantics are of note. He differentiates between categories that are "principles, methods, interpretations and selections" and offers a web of variations of thought within these (e.g. reflexive, operational, entitative, etc.) as a "means of isolating successive aspects of proposed meanings for consideration and development." McKeon provides an important perspective about the history of philosophic inquiry as "a structure of hypotheses concerning a common question viewed from an orientation of different modes of inquiry." His review of these basic systems of knowledge harking back to ancient philosophy, all the way through the lessons of one of his masters, John Dewey—another primary figure deeply influential for design—offers helpful insight into communication, pluralism, community and the dialectic of systems that are all foundational subjects that serve as the basis for theory building in this qualitative research study.

Dewey's Pragmatism

John Dewey's philosophical inquiry has had a profound impact in design and design education. As a pragmatist, Dewey provides insight into the *purpose* of inquiry and elucidates a process that can often be characterized as “uncertain, unsettled, disturbed” (Dewey, 1938, reprint, 2008). Some of the primary concepts about the dynamic and interactive aspects of experience that he espouses in *Art as Experience* (1934) as well as on primary structures of methodological inquiry from *Logic: The Theory of Inquiry* (1938, reprint, 2008), which have been instrumental in informing the design methods literature at the end of the 20th century and into current critical writing (DiSalvo, 2012), anchor key aspects of these four cases studies in which designers often find themselves in situations where the definition of the problem is not given as part of the design brief, but where problem seeking becomes part of the challenge along with questions that arise throughout the pursuit of the project:

“Inquiry is the controlled or directed transformation of an indeterminate situation into one that is so determinate in its constituent distinctions and relations as to convert the elements of the original situation in a unified whole.... A problem represents the partial transformation by inquiry of a problematic situation into a determinate situation. It is a familiar and significant saying that a problem well put is a half-solved” (Dewey, 1938, reprint, 2008: 104–115).

Rittel: Design as Argumentation

“Everybody designs sometimes, nobody designs always—design is not the monopoly of those who call themselves ‘designers’” (Rittel, 1987). Toward the end of his life, in a lecture and essay titled “The Reasoning of Designers,” Rittel set forward important considerations about how to distinguish the universe of design from other knowledge domains and begin building theory about a science of design and the

characteristic commonalities that define its practitioners. Key to Rittel's argument is that designers have a unique reasoning logic that sets them apart. He emphasizes how their work starts from a place of imagination that leads to planning and intervention through model making—what we would refer today as “prototyping.” Two key concepts are central for Rittel's proposed framing. First is a strategy of rhetorical inquiry with the idea of design as a process of argumentation: “learning what the problem is IS the problem.” Here he points to the inner debate and iterative process that designers go through in order to arrive at problem solving: “the image of its resolution develops from blurry to sharp and back again, frequently being revised, altered, detailed and modified.” Second, he emphasizes how deeply affected designers are by their own imaginations and world views, in turn enacted in a social context where they have “epistemic freedom”—i.e., certain choices that the designer makes are beyond any logical reasoning or necessary order. Rittel underlines the reflexivity in this mental process that is informed by the individual and the social context, and calls for a science of design to be developed that may prove useful in clarifying further the designer's role and reasoning. Rittel's contributions as well as his (and Webber's) famously “wicked” qualifier for complex problems that are hard to put boundaries around—increasingly the types of problems that the contemporary designer tackles—are keenly relevant to this research.

Positivism and Reflection: Simon and Schön

In contrast to Dewey's strategy of inquiry, which distinguished between problems of common sense and formal scientific problems (Buchanan, 2009), Simon provided a hierarchical scaffolding and methods for organizing and interpreting phenomena, placing the theory of design and the variety of methods and tools that designers use within a

broad context relevant to contemporary practice, pursuing a positivist strategy that is considered one of the most clear articulations of design science in the 20th century (Buchanan, 2009). In *Sciences of the Artificial* (1969: 111) Simon not only provides one of the classic definitions of design—“to devise courses of action aimed at changing existing conditions into preferred ones”—but also offers a paramount framework that integrates the domains of cognitive psychology and artificial intelligence, and extends design into further problems of complexity such as social planning and the design of evolving and hierarchal systems. Simon’s theoretical analysis about the activity of design and the designer’s ability to offer unique cognitive processes for decision-making and to foreshadow alternative futures—how things might be (the artificial), as opposed to how things are (the natural)—provides an important heuristic lens for this study which delves deeply into an inquiry that connects design thinking with organizational theory and management practice.

The critique of Simon’s “technical rationality” that Schön provided in the 1980s in *The Reflective Practitioner* (1983), along with his influential theory of organizational practice and humanistic perspective about design as a process that is fundamentally reflective, is also relevant here. Schön presents design as a strategy of inquiry in the tradition of Dewey; his perspective helps position design on organizational grounds, and in this sense has provided a valuable counterpoint for this study as well.

Participatory Design, the Capabilities Approach in Development and Structuration

Participatory design, harking back to its origins in the Scandinavian social democratic model of the late 1970s, has evolved into an established practice. Design teams can draw upon the tacit knowledge of users to identify issues and solutions that

may otherwise elude them (Press & Cooper, 2003). In designing for a specific group or context, users may also gain a sense of “ownership” about the design that can lead to more successful outcomes. The seemingly expanding arc of cross-fertilization between participatory and human-centered design and the development discipline (Margolin, 2007) has key implications for this study. In development projects that engage designers, principles of design thinking, co-creation and participatory design that place people at the center of the design exploration and process—beyond reducing them to “end users,” have been at the forefront of design research approaches and design activities. These principles, when juxtaposed with contemporary theories of development that permeate many of today’s most dynamic approaches to societal advancement and poverty reduction are of great significance. Human development as a development paradigm advances the notion that development is fundamentally about people who are “the real wealth of a nation” (UNDP, 1990). In the past two decades, the concept has evolved to also increasingly posit that people are both agents *and* beneficiaries of their own wellbeing (UNDP, 2010). Importantly, human development as a framework for measuring human progress introduces a plurality of values beyond economic growth—including equity, sustainability, respect for human rights and dignity—as essential to an individual’s ability to thrive (Sen, 1999).

British sociologist Anthony Giddens’ (1979) theory of structuration and his holistic view of modern society (*Central Problems in Social Theory*, 1979) sheds light into questions of shifting identities and changes in agency that impact designers within a social system that has interdependent forces, and also amidst evolving organizational

structures: “society only has form, and that form only has effects on people, insofar as structure is produced and reproduced in what people do.”

The interwoven theoretical streams cited above directed the analytical attention to the over-reaching research question of this study: examining driving factors that are helping redefine the role of the designer in a social innovation context and in the public sector. They also informed the process of inquiry overall, and in particular with regard to the gaps in understanding that this complex redefinition of roles is causing.

Methods

Methodological Approach

This study adopts a grounded theory approach along with case study methodology. Grounded theory, derived in part from the theoretical underpinnings of the Chicago School of Sociology and the development of symbolic interactionism, provided an ongoing systematic process of interpretation about the human behavior and social dynamics at play, and led to emergent conceptual analysis through constant comparison (Glaser & Strauss, 1967; Strauss & Corbin, 1990). Theory building from multiple cases offered in turn an optimal mechanism to explore the world of theory and the experience of practice, and arrive at replications, contrasts and extensions of the emerging theory (Yin, 2014) in order to bridge rich qualitative evidence to mainstream deductive research (Eisenhardt & Graebner, 2007).

This researcher’s background as an established practitioner in the social impact design education arena informed the collection and analysis of the data as well.

Sample

The selection of the study's sample (see Appendix G) consisted of four specific cases in which the process of interest, i.e., the key research question, could be “transparently observable” (Pettigrew, 1988 as cited in Eisenhardt, 1989), and would provide the opportunity for purposeful sampling to build and extend emergent theory about the paradigm shifts at play. Thus, the study follows a deliberate sampling plan: the multiple cases identified all include designers working within varying degrees of interdependency with non-designers to arrive at large-scale, sustainable outcomes with an aspiration for social change. Multiple case selection was critical to ensure better grounded, more accurate and generalizable theory (Yin, 2014). For each case, interviews consisted of the principal individuals both on the design side (members of the design teams interviewed ranged from three to five individuals per case) and on the “client” side (clients interviewed ranged from two to four per case; “clients” were typically the funders and/or project managers chiefly accountable for the project's outcomes and implementation). Interview access to key stakeholders for each of the cases elicited rich data and led to information from pluralistic perspectives through a total of 28 interviews. The sampling approach also included “polar types,” in which extreme cases were included in order to more easily make comparisons and observe contrasting patterns in the data (Eisenhardt & Graebner, 2007).

Hence, *Clean Team* and *Project Mwana* are both cases that benefited from the contributions of design teams in prominent global design consultancies based in the United States: IDEO.org and Frog Design, respectively. Both also present situations where the design innovation was targeted for users that live in conditions of extreme

poverty in Sub-Saharan Africa (Ghana for *Clean Team*, Zambia and Malawi for *Mwana*). On the opposite end of the spectrum, *Branchekode.dk* and the *Design Exchange Program* are initiatives developed by design innovation teams that originate from “developed” world regions with advanced design fluency—Scandinavia—and unlike IDEO.org and Frog Design, they are embedded in governmental structures (Mindlab is a Danish cross-ministerial unit based in Copenhagen, and Helsinki Design Lab is an initiative of Sitra, the Finnish Innovation Fund based in Helsinki.)

Data Collection

Data collection occurred between February and June 2012. This process consisted of semi-structured face-to-face interviews ranging from 60 to 90 minutes in length that were digitally recorded with the participants’ permission, and transcribed by a professional service. Despite the international scope of the study, all interviews were conducted in English and no translation services were required, as all interviewees were native or highly fluent English speakers. Interviews for the *Clean Team* case happened in New York, Pasadena and London (with participants from IDEO, IDEO.org, WSUP and UNILEVER); interviews for *Project Mwana* were conducted in New York (with members of UNICEF and Frog); interviews for *BrancheKode.dk* happened in Copenhagen (with the Mindlab Team and ministry staff); and interviews for the *Design Exchange Program* occurred in the Finnish cities of Helsinki and Lahti (with the team of the Helsinki Design Lab, government and city staff). Out of the 28 interviews in the study, only five were conducted over Skype; these included interviews with designers from IDEO, IDEO.org and Frog Design who were in Austin and San Francisco, and key project managers for UNICEF and WSUP based in Africa.

The interviews represented the principal source of data for this study; the analysis was also complemented with data gathered from observation, field research notes and from information in extant texts (including Power Point documents, media articles and reports associated with the four cases).

The interview protocol (see Appendix C) consisted of an initial set of three open-ended questions intended to make a broad sweep of the landscape of the research topic and get at the participant's experience and conceptions of the issues in their own vernacular. A set of intermediate level, more focused questions followed, and varied slightly depending on the role of the participants in the project (designers versus project managers); these typically invited opportunities for deeper levels of probing. Ending questions aimed at bring participants to a conversational level and finish the interview with positive responses (Charmaz, 2014).

Throughout the data collection process, a key priority was to remain self-aware, flexible, non-prescriptive, "open to the new, the different, the true" (Gadamer, 2008) and ready to evolve the ongoing interpretation of the data following new insights as they emerged.

Data Analysis

Following a grounded theory approach (Charmaz, 2014; Strauss & Corbin, 1990), data analysis was pursued simultaneously to data collection and from the beginning of the research study. This constant comparison method made it possible to go back and forth between data collection from the interviews, coding and memo writing to shape the emerging analysis. All interview transcripts were read several times, and all audio

recordings were carefully reviewed to ensure no data was missed before formal analysis began.

At its core a heuristic and a cyclical act (Saldaña, 2012), coding is a problem-solving technique that leads to subsequent interpretive rendering. In a first-stage sweep of open coding, the focus was on labeling and describing line-by-line the phenomena with potential meaning stemming from the interview transcripts. Clusters of concepts and interactions that started emerging were identified before the application of any organizing framework. This emerging data gathered from the interviews was then reviewed against the initial research question; this first stage of inquiry helped refine the interview protocol and in turn elaborate it, with more probing through theoretical sampling.

The process yielded 166 open codes of note across the four cases. From these open codes, significant patterns of commonalities and differences emerged that started shaping initial avenues for interpretation. In order to arrive at a more precise analysis for theory building, an organizing framework that consisted of a language analysis for each case was developed (see Table 4 for data structure that presents recurring concepts in all four cases).

Table 4: Language Analysis: Key Concepts Across 4 Cases

1.1	DESIGNER VALUES	CLIENT VALUES
commonalities	Entrepreneurialism Collaboration Human/user-centered innovation	Entrepreneurialism Collaboration Human/user-centered innovation
differences	Co-creation Communication Openness/trust Cultural Relevance Empathy	Reliability Profitability/Productivity Speed Competitiveness
1.2.	DESIGNER: Definitions for Activities	CLIENT: Definitions for Activities
commonalities	Deliverables Visualization/Translation	Deliverables Visualization/Translation
differences	Iterative Generative Synthesis Modeling/Making Exploration Process	Systemic/Disciplined Process Innovation for Business Model Creation Bottom Line/Organizational targets Value Creation Quantitative Rationale Needed Outcomes
1.3.	DESIGNER: Definitions for Activities	CLIENT: Definitions for Activities
commonalities	Challenging Multiplicity of stakeholders Uncharted territory	Challenging Multiplicity of stakeholders Uncharted territory
differences	Time/space constraints Un-defined/open brief	Quantifiable outcomes needed Metrics for value creation Necessity for business case validation

The structure of the framework consisted of a binary frame (designers versus clients) and included three key categories: 1) a study of the language used by designers and clients around values and goals of the project at hand; 2) a study of the language used to describe activities and methods used in the project; and 3) a study of the language used to characterize the context and situation of the activities of the project. Open codes were clustered around six to ten substantive concepts (typically distinct for designers and clients) that helped integrate and impel the analytic story behind the data, and move the

research into the nature of the phenomena under the study. Close attention was paid to considering language not simply as words, but as symbols in a variety of modes of expression (Buchanan, 2001a). Given this researcher's interest in probing where there were commonalities of worldviews between designers and clients, observed patterns of common language use between groups for each category across cases were flagged.

Throughout this semantic analysis, the goal was to embrace an approach of "systematic pluralism" as an avenue to inquiry in the philosophical tradition of McKeon; seeking to be aware of, and gain insight from the "*terministic* screens" (Burke, 1966) that interviewees revealed, i.e., the ingrained communication symbols and filters that form a grid of intelligibility and mediate one's experience of the natural and human-made world. The analytical approach was characterized by ongoing back-and-forth, revisiting interviews, discovering and clarifying relationships between constructs and variations in order to arrive at new insights.

Findings

The data from the present research reveals a set of pluralistic views about the actions that designers are responsible for when engaged in public sector and social innovation projects, as they traverse complex organizational boundaries and experience roles that are in a profound state of flux. In this regard, the four cases validate the central contention of this study: that the roles designers are enacting are rapidly shifting amidst a broad range of conditions and a growing rhetoric promoting design for social innovation. But in addition to compelling supportive evidence, this inquiry yields four categories of findings related to these shifts that have important implications for both design practice and design studies.

Finding 1: Navigating an Uncharted Territory

The extent to which the context at hand emerges as uncharted is of great significance. Across interviews for our four cases (see Table 4), and at the individual and institutional levels of analysis, a consistent picture of a space that is in many ways a new, unmapped frontier comes into focus. There are two strands of formulations that are of note. First, designers (and clients) find themselves needing to continue making the case for design's capabilities in the social innovation context: a repeated discourse about the "need to produce evidence" or "demonstrate value" from this form of design engagement appears as a central preoccupation for all parties. Second, there is an unequivocal conviction from those at the helm of these cases that mapping this new frontier will require ongoing cultural change within organizational practice.

Table 5: Uncharted Territory

Interview Participant	Representative Quotes
DEP1 12	It's a lot of Ouija board.
BK2 6	We had to walk this way as to convince authorities to spend time and money on working with us in trying to come up with these kinds of collaborations. It takes time. It's a cultural change, too.
M4 10	I think this particular project really allowed us to formalize a discipline in our organization's words, or in our organization's constructs of the steps you need to go through, which are very much all design focused, especially end user research, testing, building with simplicity, looking at the end user motivation. All of those kinds of aspects really put those concepts and words, which I think are may be familiar for designers in the outside world, but not at all familiar in a way my colleagues who are also not designers, can also talk about it and advocate for why it's important as a budget line item as a practice within technology projects. ... It took struggling for me to figure out how to justify allocating resources.
CT 3 6	I think I know what the reason is, but I need to produce evidence. And in the end, people talk about business cases. They want the business case. If they don't believe it, it doesn't matter what numbers you put in front of someone. You've gotta make both the rational case and the emotional case, but broadly speaking, making that case and getting the organization to recognize it.
M2 5	We kind of had to say: we're not sure what success looks like in this project. We don't know what they mean. They really do not know what they mean.

BK1 15	You could argue that we were in a different space....It was demonstrating at a strategic level how might we drive cross-cutting collaboration in the public sector in the future, how might we inspire others to think in designer methods and so on.
DEP1 3	How do we actually make this a culture that is receptive to design? And the only way, really to do it is by doing projects with people. So people actually experience differently, understand what doing things differently means and why it may be valuable to do things differently.
DEP1 3	What does it mean to do large-scale innovation, broad-based innovation? With a real focus on government meets design.... It's also not a science you can hire for. There is no discipline...There are pockets of people doing really interesting work... There is no community.

Finding 2: The shifting identities in designers' roles provoke a set of unique challenges.

The notion of a space of practice that remains largely un-codified is consequential in that it presents a number of unique challenges both from a perspective of attempting to define the variation in methods, principles and strategies behind the plurality of design processes that occur in these cases, and from the standpoint of the overreaching goals and the outcomes of the projects themselves (see Table 6). How individuals qualify the tensions that emerge and the opportunities that arise is significant. As one of the lead designers in our interviews summarizes: “There is no client for the work we are doing. There is usually no funding for it. There is no culture for it. There is no brief. No one even knows if there should be a brief, even though we all know we’re about to fall from the cliff.” (DEP, 16) “Falling from the cliff” references a state of the world where the call for social innovation connects many disparate issues and requires a holistic integrated approach that designers can be uniquely poised to contribute given their skills as visualizers who can embody, integrate and synthesize matters at hand.

Table 6: Shifting Identities in Design Roles: Challenges

Interview Participant	Representative Quotes
M1 12	I think what we're hoping to achieve with design and find these moments where we can be a catalyst and see something take off and reach scale, but understand that we're not the custodians of that journey.
CT2 11	I think because we had such a loose brief, it was hard to define exactly what was right.
M1 4	It's truly a privileged role to be in, but I think that sometimes we lack the humility to realize that just bringing that clarity to things is not the same as fulfilling on the potential and the value and the impact and there's a difference there.
M2 8	We really did not know what to make. It was one of those projects where it's not like you are saying, "We're going to build a washing machine, and you do all of the research, and at the end there is a washing machine. We really struggled to figure out what it is that they really needed.
BK1 15	Ultimately a successful project is one where the client is happy, and actually some of the questions we were raising along the project here, we didn't necessarily make our colleagues happy.
DEP1 40	Actually, if we want to get into shaping decision-making and not objects, we have to realize that in terms of discussion and decision-making it is not a design language. It's a business and policy bit of language. And do we expect, really that the audience will drop their language and adopt ours, or should we be more realistic and think that we need to adopt their language?
M3 18	A lot of the role of the innovation team was not just in the design process, but it was in the partnership building and ownership components. So educating the partners about what we were doing. How we were doing it. Why it mattered. Keeping everyone in line and moving towards the same goal.

Finding 3: Design emerges as a discipline that foreshadows alternative futures.

These four case studies advance evidence about design as a mode of inquiry and practice and a discipline with the tools to explore and shape possible and better futures for human beings (see Table 7). This capability of design to embody alternative futures and lend its voice to societal issues matters deeply. The following interview statement refers to the potency of this transcendent dimension of design: "Design is a leadership skill to innovate in an uncertain world" (DEP 1, 19).

Table 7: Design as Social Innovation Tool for Alternative Futures

Interview Participant	Representative Quotes
M 13	When you start a conversation with people whose experience is so rich, who have often never really been asked the question of, how might this be different, how would this be better for you?
M2 18	You could perfect this technology a million times, and it wouldn't have any impact on that particular bottleneck. So those were the reasons to do the research the way that we were doing it and to see the problem more holistically that just a technical problem.
CT1 21	They came at it from a social perspective as what are the needs, desires, and all the rest of it, of a customer? ... They found out the whole approach from the start.
M 3	Increasingly to create value ...there's a lot knitting together that has to happen, different parties, different perspectives, different services, different information. And people are looking for how to find the tools and the talent to do that knitting...design often finds itself in an almost solo role in embracing those kinds of challenges...sort of thinking about the forest and the trees simultaneously.
M2 18	The last thing we hit on: the reframing of the challenges from being technical challenges to being human challenges. I think for me that is the value of design thinking and sort of these problems is the entity.
CT2 21	The product design was the pretty picture that goes on the front of all the documents and stuff, but it was in some ways irrelevant.... It was the strategy ...and it was this service model design [that] was the real value that we delivered.
CT2 26	We have that abductive reasoning where we can see something in one place that works and apply it to a different place.

Finding 4: Plurality of Design Approaches

Finally, a significant finding is centered in the notable differences and the rich plurality of design approaches that represent the ecology of design culture (Buchanan, 2009) that the four design teams interviewed demonstrate as they strive to create change, and meet the human needs and aspirations inherent to these projects. Again, the testimony of this interviewee conveys the point: “We are in a world that is moving very quickly. So there is no unified way—and clear example—we can follow. So we are all in a way working to figure it out.... Whether we are explicit or not, we have each a kind of sense of a kind of shape that we’re aiming toward” (DEP 1, 5).

Discussion

The results of this research reveal a growing orientation toward bringing design understanding to bear on critical social problems where designers typically have not been present before (Margolin, 2004)—at least not with the level of strategic engagement and agency that emerges from the present data. Specifically, the chief design interventions and aims across these four case studies are also indicative of the considerable scope of complex social relations and actions the design teams profiled partake in and worth restating here: building a market-driven sanitation service in Ghana that takes as its central starting point the human aspirations for an in-home smart-flush toilet designed for a low-income population traditionally not included in urban sanitation solutions (*Clean Team*); engaging community health workers as key stakeholders to better support a robust mobile technology diagnostic system that operates in isolated rural settings where solving “the last mile of healthcare delivery” equates to thousands of HIV-positive infants more quickly accessing retroviral drugs (*Project Mwana*); designing a user-centered digital portal that streamlines the registration process of new business owners in Denmark and minimizes bureaucratic governmental redundancies (*Branchekode.dk*); and bringing government and design together by embedding designers in strategic government positions for a year (*Design Exchange Program*).

Shifting Roles and the Human Imperative

The cases illustrate how design is an interpretative practice (Margolin & Margolin, 2002) and a domain that can manifest itself in every area of human knowledge and practice (Jonas, 2001), one deeply rooted in the framework of culture as a whole as “the activity of ordering, disordering, and reordering in the search for understanding and

for values which guide action” (Buchanan, 1995; Margolin, Doordan, & Buchanan, 2010). In these projects designers are responsible for highly dynamic actions, learning to work together and with others, in a framework in which social resources are integrated and enhanced with the participants and stakeholders of the projects (Manzini, 2011). Often labeled as “human-centered” and “empathic design methods,” and championed by design consultancies such as IDEO.org, Frog Design and others, these are a body of techniques that vary in range and are deployed effectively in these projects. They represent an established approach for how designers access the experiences of users and turn that participatory dimension of design research into valuable insights, which can add value and accelerate innovation processes to meet social impact aims. The techniques are relevant to better understanding how users feel and what their dreams and aspirations might be, affording designers the potential to tap into latent needs and access tacit knowledge, i.e., knowledge that cannot be readily accessed by words (Polanyi, 1983 as cited in Sanders & Stappers, 2008). As the research of Sanders has shown, beyond the observed experience into what people do, use and know, the ability to empathize with users through engaging them to create specific artifacts, maps, etc., with toolkits and cultural “design probes” (Mattelmäki, 2006) is another technique widely utilized by these design teams and deployed at key generative junctures in these cases. For example, it came into play in strategic ways for the design team at Helsinki Design Lab in the *Design Exchange Program*. In the project studied, the lead designer orchestrated a series of weekly workshops that included a variety of making activities with community members to map their visions and aspirations for their goals of a new urban development project in the train-station neighborhood of Lahti. For the city architect employing this designer, the

design contributions were key and facilitated a participatory process that would define the criteria around a competition for architects to bid on the redevelopment project planned: “People trust her. They know she is there for them” (DEP2, 3). These participatory approaches are effective in accessing users’ unspoken feelings and ideas through a form of visual literacy that can lead to a level of “collective generativity,” enabling stakeholders to contribute directly to the product/service/communication system being designed. This process impacts designers’ roles in many ways as well because the function of the designer and design researcher converges to the point where they are blurring (Sanders & Stappers, 2008). It is significant to note that some of the data shows a nuanced degree of unease and ambivalence about this convergence, especially in the absence of a concrete level of designing or “making” that can be harnessed: “I am designer first, a researcher second. So if the research does not lead to design, sometimes that is the test market” (M 2, 10).

The fact that the design problems that emerge also expose increasingly ambiguous boundaries among artifacts, structure and process (Binder et al., 2011) can, at times, result in a source of apprehension for design teams navigating open-ended briefs where the recipe for “success” is no longer defined. Multiple stakeholders and diverging agendas often no longer provide a clear set of constraints that can frame the expected stages of a design process (ideation/creation/iteration/design/implementation), as illustrated in Table 4.

Significantly, the data also provides examples of an opposite set of circumstances where a strategic mode of agency is sought by design teams that choose to tackle the “fuzzy” end of these challenges, and shy away from getting involved in the more

concrete stages of the implementation curve of a project. When that execution stage is ultimately broached, it can cause tension (execution often implies decisions around resource allocations, staff, etc.) and can counter the aims of the strategic design contribution offered:

“It was really important as we got more and more concrete that we were not part of it.... those involve start arguing, who is going to have most benefit from it? Who is going to use manpower? Who is going to use their money, etc.? So we go through the facilitation part and let them agree or disagree, but we can be objective, only going for the best solution for the system and for the business, not for us.” (Bk 2, 13).

Epistemic Freedom and Actionable Knowledge

The projects under examination are ones that can be characterized as falling within the “fourth order” of design, to reference the classifying matrix of design put forth by Buchanan. Fourth order design is closely related to issues of cause and action and the area of *thought*, “concerned with the ideas and principles that operate behind the environments and systems in which the actions of designers take place” (Buchanan, 2001a). As already referenced, there is ample evidence stemming from the data about the experience of designers operating within this strategic order: primarily acting as facilitators of organizational processes and asking questions of value and principle.

Rittel’s articulation about the “epistemic freedom” that characterizes the reasoning of designers who can be uniquely suited to “cope with difficulties” (the uncharted territory identified in Finding 1) and come to terms with the fact that “nothing has to be or to remain as it is or as it appears to be, there are no limits to the conceivable” (Rittel, 1987) builds on this point as well. The following testimonial from a design lead describing a process of discovery and ideation during a design assignment illustrates

Rittel's claim positing that certain choices the designer makes are beyond any logical reasoning or necessary order: "There is always something new and so you're always having to think on your feet and be really flexible and always keep in mind what you're trying to learn and realize that the rest will kind of come into place as long as you have that focus" (M 4, 10).

That high tolerance for ambiguity also speaks to the designer's ability to constantly reframe and redefine the problem-space as a "reflective" practitioner (Schön, 1983), taking creative leaps and generating multiple perspectives to understand people, communities and societies, blending strategic intent with quality execution (Boyer et al., 2011), considering issues holistically rather than reductively (Burns, 2006) and articulating and delivering courses of action for alternative ways of being (Simon, 1969) and better ways of living.

As proven by the roles designers enact in these projects, their aptitude to presage future possibilities, engage with a multiplicity of stakeholders, visualize solutions and facilitate co-reflection and ideation are all key skill sets clearly identified and praised by the project managers and clients interviewed. It is significant that although this value is well recognized by many, considerable challenges for broad adoption of design in a social innovation capacity remain within the various organizational contexts studied. These challenges seem to be a reality across the board—even in the design-fluent societies of Scandinavia—albeit with fluctuations in kind and degree. The following testimonial exemplifies the sentiment recounted by several of the project managers interviewed: "This is very open innovation, if you like. Its locus root center is more outside [the organization] than inside at the moment" (CT 4, 8).

Collaboration and Dialectic Inquiry

“The objective of the method of inquiry is neither the resolution of contrarities into more inclusive or posterior dialectical unities nor the organization of more primitive principles, but the discovery of problems and the advancement of knowledge” (McKeon, 1951)

This statement by McKeon, culled from one of his seminal essays on philosophy and method, encapsulates in many ways the significance of the phenomena observed in this study, particularly with regard to the collaborative dynamics between stakeholders that the research surfaces.

In essence, design emerges as a discipline uniquely suited to help frame new problems of inquiry and contribute effectively to social innovation challenges and to the public sector—in fluid contexts that not only call for creative problem-solving, but also for new approaches to context setting, given the complexity of the interconnected and boundless issues at play (Hill, 2012).

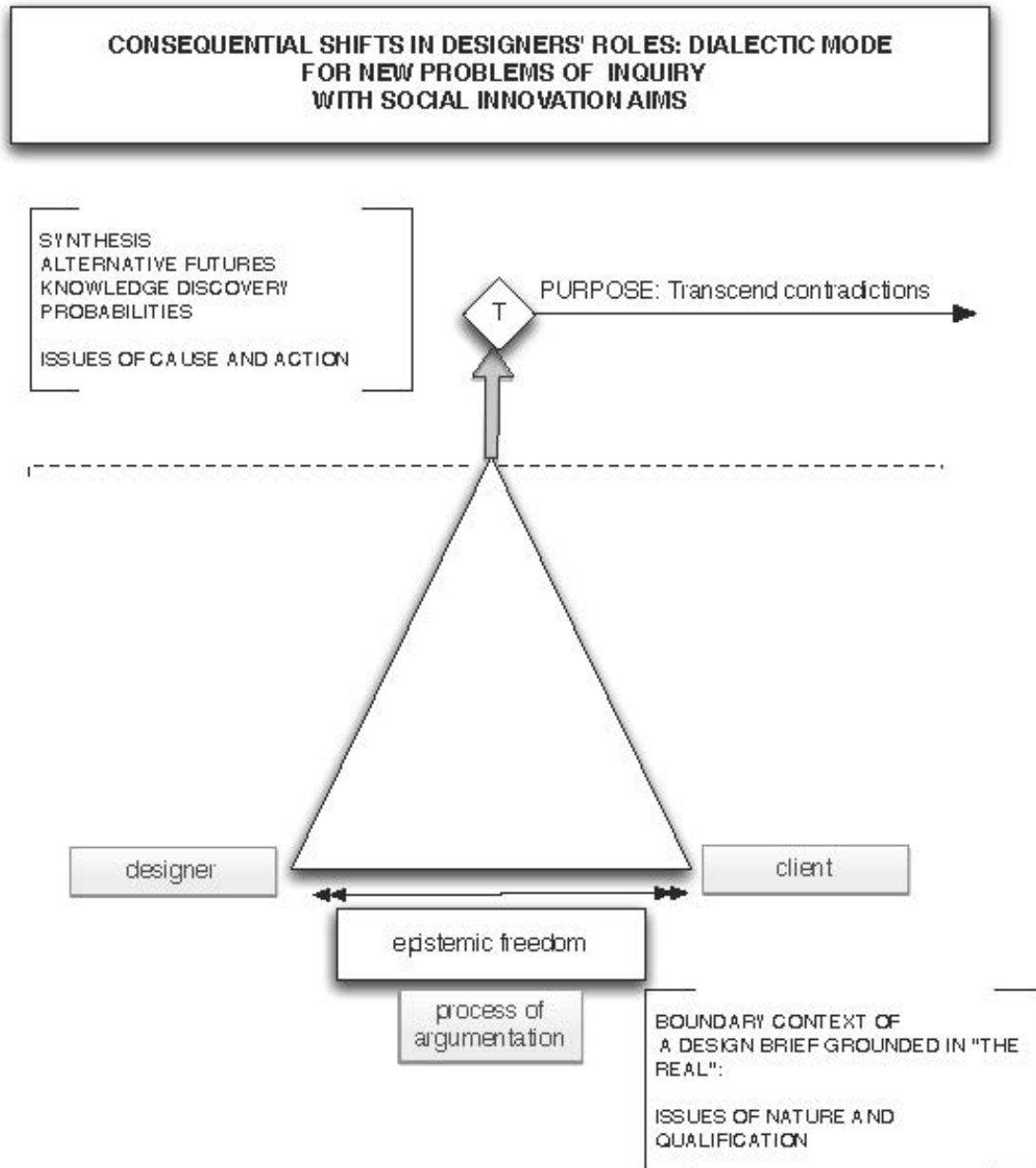
As a path of understanding, dialectical methods of inquiry seek to find the truth by a process of questioning that removes barriers to higher levels of comprehension and knowledge in a recursive process that never reaches a final determination. It is a mode of investigation designers in these projects are rediscovering. They are using this mode of inquiry with a newly found awareness about the transformative promise it holds for true communication, collaboration and lasting innovation with regard to designing more humane systems. This design leader’s testimonial elucidates the point:

“You start a conversation with them and you don’t want it to end. Because you’re tapping into a perspective, knowledge, meaning, that is non-trivial, not commonplace, and precious....And one of the things we have been looking across these projects is how do you sustain that conversation? How do you make that more of an ongoing dialogue and discussion?” (M 1, 14).

That kind of pragmatic dialectic leads to core questions for design practice in this space: How might this way of working together be different? How might it be a means for isolating better and more actionable outcomes for these projects that have such high aspirations for social change?

The relations between designers and clients in this social innovation process through dialectic inquiry is represented in Figure 6 as a conceptual model that summarizes the actionable and strategic roles of designers in the context of the cases studied. The model illustrates Rittel's contention that designers address wicked problems through a *process of argumentation*, a process he qualifies as disorderly not because of intellectual sloppiness, but due to the nature of these design problems where "learning what the problem is IS the problem" (Rittel & Webber, 1973).

Figure 6: Conceptual Model



Limitations

Our sample was limited to four case studies in which designers engage in complex projects where their expertise was deployed among multidisciplinary teams for a social innovation overall aim, across a variety of organizational structures. Our

methodological approach subscribed to both a grounded theory methods approach and case study methodology. By its very definition, the tendency of case study methodology is to illuminate concrete problems within a set of phenomena, but it is at its most effective when an intentional strategy directs its logic of design (Yin, 2014). The semantic framework that we chose as our analytic lens and logic for design may have precluded us from interpreting data converging differently, which could well have led to other generalizable insights.

Implications for Practice and Future Research

As our findings illustrate, this research has implications for the growing field of design studies as it intersects with the field of public and social innovation, as well as practical implications for organizational practice, both for design teams and for managers who contract design services. Among the issues that emerged in the data which merit further study is the need for a better articulation about organizational readiness for embedding these forms of strategic design; what might be appropriate procurement processes to have in place, and how the pipeline for recruiting such designers might be amplified.

This study also surfaces important questions of accountability and responsibility as related to the measurement of social impact and the value—quantifiable or not—of design innovations and interventions such as those reviewed in these cases. Undoubtedly, this is an aspect that merits further research as well, and confirms in no uncertain terms that the understanding of designers’ contributions in this capacity remains an emergent phenomenon. What is the R.O.I. or, better yet, the R.O.D.—return on design—that the organizations contracting or embedding such design teams can claim? How might design

investment be determined on such social innovation projects or programs? What might be the opportunities to name and qualify the value of design for this sector? These are just a few of the core questions that might be probed in a follow-up study to build on the present findings.

Conclusion

This study augments, rather than replaces, the cumulative understanding of how design and designers function with a plurality of modes of thinking and practice, within the social innovation field and in the social and public sectors.

As one of the designers interviewed eloquently states: “I think what we’re hoping to achieve with design and find these moments where we can be a catalyst and see something take off and reach scale, but understand that we’re not the custodians of that journey” (M 1, 12).

At the root of this reflection is perhaps another key provocation this study brings forth: why might we care to delineate more effectively the boundary zones of this actionable mode of design engagement? The answer could be, we might venture, because there is hope and significance in better understanding the pathways designers offer toward alternative futures for all human beings to live more humane and sustainable lives. These are issues of cause and action that matter deeply to organizational practice as it confronts the challenges of the 21st century.

Prelude to Chapter 2

“A number is an element in a field of variation. Its specific numeral property consists in its relations with other elements in the same field, which relations are expressed in rules of order.”

— Scott Buchanan, *Poetry and Mathematics*, 1929

This quantitative chapter of the dissertation pays special attention to the difficulties met, solved, or circumvented in my process of learning multivariate factor analysis and gaining the discipline to follow successive steps of statistical examination to uncover the significant relationships between the core variables of my inquiry. This chapter is also about a more fundamental journey of discovery into finding meaning in the latent affinities between numbers and words, and new relevance in the particulars of linking mathematical formulae with coherent explanations.

CHAPTER 2: EXPLAINING THE EFFECTS OF DESIGN ATTITUDE ON TEAM LEARNING, PROCESS SATISFACTION AND SOCIAL INNOVATION OUTCOMES⁵

Introduction

A social enterprise that rents portable toilets to families with no prior access to in-home sanitation in urban slums of Kumasi, Ghana; HIV-positive results of newborns delivered via SMS message to medical personnel in rural areas of Zambia, cutting down by 50% the lapse between diagnosis and treatment; a seamless online portal that allows new business owners to register their companies with the Danish authorities and get right to business; an urban redevelopment plan for the city of Lahti, Finland, co-created between city authorities and citizens: these are the four design projects that we studied in detail in chapter 1, which illustrate situations where designers are addressing human needs linked to large-scale social, cultural and economic challenges (Margolin & Buchanan, 1995).⁶ Today, these emerging practices of design are increasingly oriented to promoting processes of social change and result in social innovations—new ideas that meet unmet needs (Mulgan et al., 2007). Social innovations are gathering momentum to move from the margins to the mainstream (Davies, 2013), and are not unique to the public sector. They can be driven by politics and government (for example, new models for health care or education delivery), markets (for example, micro-enterprise or organic food), movements (for example, fair trade), and academia (new pedagogical models such as MOOCs) (Mulgan et al., 2007). With this growing recognition of design's potential for

⁵ Quantitative Research Report, August, 2014

⁶ These four case studies of design for social innovation projects examined in chapter 1 were led by ideo.org; Frog Design, Mindlab and the Helsinki Design Lab and informed the present chapter of the dissertation; in addition, the Danish case study, Mindlab's *Branchekode* project, was expanded into a chapter that is included in Christian Bason (2014): *Design for Public Policy*. Ashgate.

social innovation and its relevance as a strategic resource to the private and public sectors (Bason, 2010; Boyer et al., 2011; Romme, 2003), a new set of questions are emerging which concern how to codify and explain such contributions from design and designers. Furthermore, there is a wide acknowledgement that a concerted effort to arrive at a better understanding of the possibilities, limits, and implications of design within social innovation (Manzini, 2014) will advance the work of innovators themselves, and many of the diverse actors in the field (Mulgan et al., 2007). The urgency to understand how design may help achieve social innovation outcomes, however, is fraught with difficulty, since the social innovation field is more complex than traditional industrial and technological innovation, for example, partly because it happens at the crossroads of multiple sectors and disciplinary boundaries (Murray et al., 2010). The attempt to translate what we refer to as the “return on design” (ROD) (Amatullo, 2013), and demonstrate the value designers may bring to society’s capacity to innovate, is thus an important, yet understudied pursuit.

This study addresses one element of this gap by investigating key shifts that occur within the professional identities of designers who operate as social innovators and change agents (Margolin, 2007; Walker, Giard, & Walker, 2013). In the projects we examine, designers participate in compelling new social relationships with collaborators and end-users (Binder & Brandt, 2008; Ehn, 2008) and contribute to processes of innovation that often demand a re-conceptualization of their skills, as well as an expansion of their toolkit of techniques and practices in order to generate effective results. Despite a mounting body of research in social innovation design (Julier et al., 2014; Mulgan, 2014; Staszowski & Manzini, 2013), surprisingly little is known about the

fundamental abilities, as well as the practical methods and practices that are likely to prove effective for designers that work in this emergent space. Our central premise is that we may be better positioned to harness design's unique contributions to social innovation, if we expand our understanding of the impact of these essential capabilities. To this end our inquiry centers on the development of a set of foundational metrics that we hope might better explain how and why design matters in this context.

Core to our investigation is the operationalization of a new multidimensional construct- *design attitude*-, which we define as *the aggregate of a set of distinct abilities that designers need to apply during designing or engaging in social innovation projects*. This construct has been investigated in the past to advocate for a more intrinsic role for design within organizations, and has been posited as a valuable factor that influences positively generative inquiry and action in management (Boland & Collopy, 2004; Boland et al., 2008). Boland and Collopy, who initially coined the term (*Managing as Designing*, 2004), argued that managers should not only act as decision makers, but as designers, and called on managers to learn from designers' liquid and open orientation to projects, from their treatment of situations as opportunities for invention, from their questioning of basic assumptions, and from their resolve "to leave the world a better place than we found it" (Boland & Collopy, 2004: 9). Kamil Michlewski's (2007, 2008) research expanded this foundational conceptualization when he identified several components of design attitude based on interviews and case studies. He also built upon diverse streams of literature in management, design research and theory to synthesize and theoretically triangulate the construct with other constructs (Cooper, Junginger, & Lockwood, 2013; Rittel, 1987; Schön, 1983; Simon, 1969). Finally, Richard Buchanan

has recently further articulated the elements of design attitude in his theoretically informed qualitative work in a re-conceptualized metric map that expands on Michlewski (unpublished, 2009, see Appendix A). Alas, so far no one has developed a rigorous construct operationalization for design attitude and established its validity. To address this gap, one of the chief aims in this study is to define the construct rigorously and establish its key facets of validity (MacKenzie et al., 2011). Drawing upon a strong theoretical review and prior theoretical and empirical work on design attitude, we propose a formative, second-order construct for design attitude that is composed of six observable dimensions (traits): 1) ambiguity tolerance; 2) engagement with aesthetics; 3) systems thinking; 4) connecting multiple perspectives; 5) creativity; and 6) empathy. These dimensions, in turn, allow us to specify carefully the construct domain for design attitude, articulate scales for each of its dimensions, sample from potential items pools, develop item battery and validate their measurement properties. Finally, we are able to validate the scales and the construct using well established statistical methods to establish construct validity (MacKenzie et al., 2011).

Overall, our research in particular seeks to address the following three research questions:

- 1) What are the key dimensions of design attitude and how are they related?
- 2) Does design attitude relate significantly to social innovation outcomes, process satisfaction and team learning?
- 3) Do prototyping, visualization and user participation impact social innovation outcomes, process satisfaction, and team learning in the context of high or low design attitude?

To address these research questions, we develop and validate design attitude as a newly operationalized construct that introduces key design techniques and practices, and links design attitude to process satisfaction, team learning, and social innovation project outcomes. For our investigation we conduct a survey that treats design attitude as an individual perception of designers and project managers who are regularly engaged with design for social innovation initiatives; our questionnaire also probes what influence common design techniques—prototyping and visualization- and manners of practice-user participation in the design process—have in accounting for observed impact.

In this regard our study extends prior research on design attitude and reveals positive and significant relationships of this construct in the context of social innovation projects. By establishing the nomological and predictive validity of the design attitude construct, we also provide new insights into design behaviors that influence social innovation processes. By departing from the past qualitative-based studies that have wrestled with the elusive impact of designers' modes of engagement in the field of social innovation, our findings demonstrate significant positive effects of design attitude on social innovation, team learning, and process satisfaction. In this sense, our study provides strong evidence of the potential positive role of design attitude in social innovation.

The remainder of the work is organized as follows. In the following section, we provide an overview of the theoretical underpinnings that guided our research. This section is divided into two subsections: the conceptualization of the design attitude construct, and the conceptualization of the key theoretical constructs that influence design outcomes. In the first subsection, we introduce prior work on design attitude and its

implications for the selected approach, and discuss our reconceptualization of design attitude. In the second section we conceptualize the supporting constructs that inform our study within the larger context of design for social innovation in order to develop our conceptual model. Subsequently, we hypothesize relationships among the constructs and provide the theoretical foundation for the conceptual model proposed to formally validate these relationships. Next, and in light of the near-absence of established quantitative frameworks to assess the impact of design on social innovation, we describe our research design and methods to create new psychometric scales for design attitude and establish its construct validity. We also further articulate our process to develop or adapt scales for the other constructs that complement our understanding of the effects of design attitude on design for social innovation. Finally, we discuss major findings that ensue from the analyses. We conclude with a review of theoretical and practical implications and explore future avenues for research.

Theoretical Framework

This study seeks to explain design defined in its broadest sense as a concrete human activity within a larger system, grounded in the richness and complexity of human experience (Buchanan, 2007). In this sense, we seek to uncover important considerations that may reveal the value of design thinking and design practice as these take on a pluralism of forms—a diversity that is attested by the projects reported in our dataset (see Appendix H)—whether the object of design results in discrete artifacts of industrial or communication design for example, or in seemingly intangible products such as services and systems.

The basis for the research questions of this study emerged from our prior qualitative research where the concern to claim design's unique "return" or value, and articulate more effectively key factors that might predict successful social innovation outcomes was central to all participants in the four case studies that we reviewed (Amatullo, 2013). Providing a scaffolding to build the evidence base and impact measurement that can help make the case of design overall in the social innovation sector also appeared as a timely focus corroborated by the current debates that emphasize the lack of metrics to assess design's impact in the field (Design Council, 2013, 2014; Julier et al., 2014). In this regard, our anchoring of this quantitative study in the examination of the design attitude construct as a locus to capture measurable value presented us with the opportunity to wrestle with the question of measurement and circumvent more traditional debates about merely "descriptive" definitions of design thinking and design practice, of which there are many. Instead, we probe in-depth a "formal" definition for design that brings together key dimensions and relationships of observable phenomena, and serve to establish the boundaries of our inquiry (Buchanan, 2001b). Below we provide a summary review of the important ideas that have shaped influential research on design attitude, and present a reconceptualization and operationalization of this construct.

Conceptualization of Design Attitude

The original conceptualization of the design attitude construct by Boland and Collopy can be traced back to two sources: first, to work they initiated in 2002 around the concept of "managing as designing" and their advocacy for a need to change an overly analytical curriculum in business schools in favor of a more existentialist voice in management education (Boland, 2011); second, to their experience of working with the

architect Frank Gehry and his team on the design of the Peter B. Lewis Building at Case Western Reserve University which led them to organize a formal study that investigated innovations in architecture, engineering and construction associated with Gehry's practice (Boland et al., 2008).

Boland and Collopy define design attitude "as expectations and orientations one brings to a design project" (2004: 9), highlighting designer's capabilities as a distinct set of heuristics that deviate from the decision-making of the manager. While the authors recognize that decision-making and designing are clearly linked in management action, they lament a management tendency to emphasize decision-making at the expense of design considered as a mode of cognition and as organizational practice (Boland et al., 2008). In this sense, they approach design attitude as a fundamental concern for the "invention of new alternatives," the questioning of assumptions that may have become invisible or unnoticeable, or simply not even envisaged during the initial framing of a situation at hand. An important theoretical influence for the use of "attitude" in the conceptualization of the design attitude construct has been for Boland and Collopy the work of Pierre Bourdieu (Boland, in correspondence with author), particularly the sociologist's theory of practice and the concept of *habitus* as a system of dispositions that represent schemes of perceptions, thoughts and actions that individuals exhibit in practice when caught in a dialectic between individual agency and external social structures (Anderson, 2004). By placing emphasis on this dialectic of structure and agency that determine human practice, and on design attitude as an unfolding process that can lead to human betterment, Boland and Collopy make a call to action about the potential role of design and designers in shaping organizations, products, services, and processes that can

be more functional and bring new value to society (Boland & Collopy, 2004). Their conceptualization not only implies a propositional and reflective stance about design (Schön, 1983; Simon, 1969) but also adds to an important stream of research about the problems of agency, identity and moral foundation of design (Buchanan, 1992, 1998; Margolin & Buchanan, 1995).

Following a grounded theory approach, Michlewski has recently extended Boland and Collopy's conceptualization by investigating what constitutes a design attitude in the field. By doing so he conducts one of the first in-depth studies that attempts to isolate what design attitude is made of in the context of a professional culture of design (Bloor & Dawson, 1994; Van Maanen & Barley, 1982). Specifically, the study focused on four private sector organizations and innovation consultancies, including IDEO and Philips Design, which have created design-cultures that both designers and managers treat as exceptionally successful. Michlewski's theoretical sampling of cases seeks richness and diversity; his exploration of "the culture of designers" and the meanings and implications of a design approach is then carried out using a series of semi-structured interviews triangulated with an existing body of theoretical and empirical knowledge (Cooper et al., 2013; Dumas & Mintzberg, 1989; Myerson, 2001).

Michlewski's research follows an inductive process, recovering meaning from recurrent concepts about valued skills (visual thinking, sense of aesthetics, transparency in communication, etc.) and central beliefs (such as invoking intuition, concentrating on people, being playful, etc.) that participants in the study identified with in their problem-solving/ design processes. His analyses yield five main categories for design attitude: 1) 'consolidating multidimensional meanings; 2) 'creating, bringing to life'; 3) 'embracing

discontinuity and open-endedness'; 4) 'embracing personal and commercial empathy'; and 5) 'engaging poly-sensorial aesthetics.' By focusing on surfacing with new detail common attitudes of design professionals and how these play out in an established organizational design context, Michlewski adds to a growing body of literature by suggesting that design attitude is an important issue in organizational change (Cooper et al., 2013). He makes the compelling argument that our organizations at large will be better equipped to navigate the complexity of the 21st century, if they embrace the culture of the design professions. From our perspective, a key strength of Michlewski's study resides not only in his reinforcement of the argument that design can be seen as "a set of tools, skills or epistemologies for more grounded organizational inquiry" (Michlewski, 2008; Romme, 2003), but also in his anchoring of the argument with specificity about the five dimensions of design attitude. At the same time, one of the important limitations of Michlewski's inductive theorizing (stemming in part from the nature of the grounded theory method he followed) is that while he provides some characteristic attributes for each dimension (see Table 8), he falls short from defining the essential properties that constitute these five dimensions in ways that could be operationalized for quantitative measurement. In this regard, his conceptualization does not include an articulation of the relationships between, and distinctiveness of, the dimensions of design attitude. A second limitation, one that Michlewski himself points out, is that since his categorization of design attitude dimensions is defined by a series of abilities, his study does not account for influential design techniques and practices that may co-determine the impact of design (Michlewski, 2008: 386).

More recently, Michlewski has addressed in part the first limitation by expanding on his grounded theory work and developing an instrument that taps into the design attitude dimensions (this instrument has been deployed in December 2013 in one study and has not yet been published). Chief amongst the aims of this instrument is to diagnose variance in design attitudes by segmenting data collection between a sample of designers versus non-designers (Michlewski in conversation with the author, January 2014).⁷ We reviewed the operationalization of constructs in Michlewski's 2013 instrument carefully while developing our construct. We specifically note that compared to the empirically derived categories for the 1st order constructs or dimensions of design attitude, the author has made several slight adjustments in the definitions and attributes of the dimensions, which we summarize in Table 8 at the end of this section.

Finally, in our review of the conceptualization of design attitude, we also note Richard Buchanan's original adaptation of the construct and its dimensions (2009, see Appendix A). In this unpublished work (shared by Buchanan with the author, October 2013), design attitude is defined as designer's "*abilities and capabilities*," and the five dimensions of Michlewski are further qualified in the context of a theoretical framework about the role of the designer as a "cultural explorer" (Buchanan, 2009). In other studies, Buchanan has defined culture "as the activity of ordering, disordering, and reordering in the search for understanding and for values which guide action" (Buchanan, 1998; Garver & Buchanan, 2000), and has qualified design as "a new liberal art of technological

⁷ The author is indebted to the collegiality and overall support of Dr. Michlewski during the early inquiry phase of this study. Particularly, his making available the full scales of his December 2013 quantitative study as it was being deployed was very helpful in allowing us to learn from his own operationalization of his previous empirical conceptualization of design attitude (2008). More information about this study will be available in Dr. Michlewski's upcoming book *Design Attitude*, Ashgate, January 2015.

culture, manifested in many forms of professional practice [and] also providing a broad intellectual perspective on the human-made world” (Buchanan, 2001b). With this characterization, Buchanan seeks to offer an understanding of design thinking and practice rooted in the philosophical tradition of Richard McKeon and John Dewey, among others. As a result, we argue that Buchanan revises significantly the five design attitude dimensions from Michlewski by enriching them with a deeply humanistic approach. It represents in this sense a clear departure from earlier work that deals with cognition, such as for example in his definition of the empathy dimension of design attitude, which he refers to as *“the ability to empathize with the human side”* and defines as *“the concern for people; the ability to communicate; the ability to feel empathy for customers as well as commercial interests; the ability to balance ego and play in groups; and the ability to tolerate differences.”*

Table 8: Design Attitude Conceptualization in the Literature (Table 1 Repeated)

DESIGN ATTITUDE	AUTHORS			
Construct conceptualization in the literature	Richard Boland & Fred Collopy <i>Managing as Designing</i> 2004	Kamil Michlewski “Uncovering Design Attitude,” <i>Organization Studies</i> 2008	Richard Buchanan “The Design Attitude” 2009 (concept map adapted and revised from Michlewski, not published, see Appendix A)	Kamil Michlewski “Design Attitude Survey Instrument” 2013 (not yet published)
Construct Definition	“expectations and orientations one brings to a design project”	Expands Boland & Collopy’s reference to design attitude as “means of creating products, services and processes that are both profitable and humanly satisfying” and indirectly defines design attitude as the “character of a professional culture shaped by designers”	“abilities and capabilities” of the designer as cultural explorer	
Attributes and Items	Unique set of heuristics for decision-making that differ from management; emphasis on agency of the design approach: Liquid and open orientation to projects; invention of new alternatives	Identifies 5 theoretical categories /dimensions that are in turn distinctively defined: 1) ‘consolidating multidimensional meanings [reconciling contradictory objectives; bridging approaches; swinging between synthesizing and analyzing] 2) ‘creating, bringing to life’ [creative manifesting; rapid prototyping; working with tangibles]	Adapts and revises the 5 theoretical categories/dimensions with humanistic emphasis of the design approach: 1) ability to see the whole situation [make connections; analytic and synthetic perspectives; consolidate multi-dimensional meanings] 2) passion for bringing ideas to life [delight in wonder and surprise; delight in making ideas concrete; delight in creative action]	Makes slight revisions to categories for operationalization of the construct’s dimensions in survey: 1) connecting multiple viewpoints and perspectives 2) playfully bringing things to life 3) embracing

• Questioning of assumptions • Resolve to contribute to human betterment	3) ‘embracing discontinuity and open-endedness [allowing oneself not to be in control; linear process and detailed planning vs “let’s see how it goes”; freedom to think and behave differently] 4) ‘embracing personal and commercial empathy’ [concentrating on people; human-centeredness; transparency of communication] 5) ‘engaging poly-sensorial aesthetics [visual discourse; visual thinking; creative dialogue; aesthetics; beauty; taste; intuition; instinct; tacit knowledge]	3) willing to take risks without fully knowing the outcome [embrace discontinuity and open-endedness; embrace ambiguity and improvisation as essential to innovation; embrace change; brave and courageous in exploration; willing to avoid premature closure] 4) ability to empathize with the human side [concern for people; ability to communicate; feel empathy for customers as well as commercial interests; ability to balance ego and play in groups] 5) willing to visualize and explore all of the senses to seek solutions [appreciate the aesthetics of human experience; awareness of the visual can break creative deadlock and stimulate dialogue; possess a sense of beauty but recognize that beauty opens the door to function and service]	uncertainty 4) engaging in deep empathy 5) using the power of the five senses
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Based on these robust theoretical and empirical streams in the literature on design attitude, our approach is to conceptualize a new (operational) definition for design attitude. We put it forward as an aggregate, or formative, second-order multidimensional construct which is composed of six dimensions (Law, Wong, & Mobley, 1998). Specifically, we define design attitude as *a composite of distinct abilities (skills, capabilities, aptitudes) that designers apply during the process of designing; the dimensions of these abilities are: 1) ambiguity tolerance; 2) engagement with aesthetics; 3) systems thinking; 4) connecting multiple perspectives; 5) creativity; and 6) empathy.* Figure 7 provides a graphical representation of these six dimensions along with their corresponding definitions. In order to establish robust construct validity for the construct, our definition conceptualizes design attitude: a) in unambiguous terms; b) with a definition that is consistent with prior key research: it integrates conceptually Boland and Collopy's underlying idea of the power of design agency, Buchanan's humanistic emphasis, and Michlewski's five dimensions for design attitude; c) with a definition that clearly conveys the conceptual domain of design attitude by specifying the type of entity the construct applies to (in this case, the designer) as well as the property it represents (in this case, the abilities of design); and finally, d) with a definition that clearly distinguishes design attitude from any other construct (MacKenzie, 2003; MacKenzie et al., 2011). In this regard, by defining design attitude as an aggregate or combination of the specific dimensions, we can argue that the concept is distinct from the more established "design thinking" term as commonly applied in the management and business context. The latter has a strong connotation as a procedural method that designers and managers can follow to explore problem-solving, with replicable steps that focus on

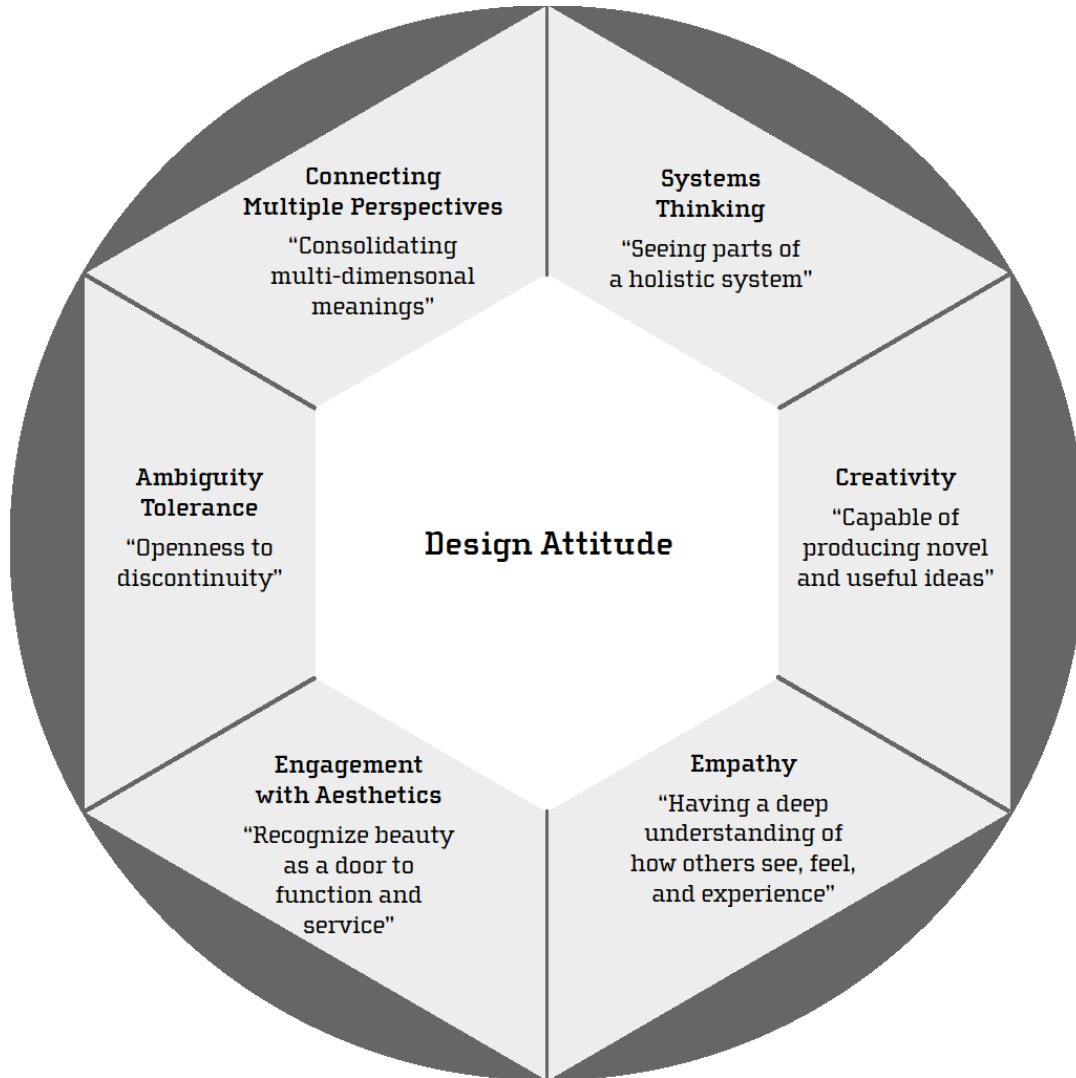
human-centered processes of discovery—with desirability, viability, and feasibility being a focal triad of notions (Brown, 2009).

Importantly, there are a few differences in our new definition of design attitude in this study that we can point to. First of all, we seek to build on Boland and Collopy's interpretation of attitude as an orientation/disposition influenced by Bourdieu's concept of habitus, and in doing so, reviewed some of the vast literature on the *attitude* construct per se. Attitude has been a preeminent concept since the beginning of systematic research in the social sciences with important debates about what may constitute a proper definition, in fields as varied as social psychology, communications, political science, and marketing (Eagly & Chaiken, 1993). In social psychology, attitude has been considered one of “the most distinctive and indispensable concepts” by one of the founders of the discipline (Allport, 1935) and has since been the subject of vast research in social psychology alone. Differing theoretical perspectives about its conceptualization continue to date, with some researchers conceptualizing attitudes as implicit individual traits that may be conscious or unconscious dispositions (Banaji, Roediger III, Nairne, Neath, & Surprenant, 2001), and others arguing that it may be ill-founded to think of attitudes as stable-trait-like representations, but instead may be momentary constructions and states of pattern activation that occur in human beings in various contexts (Schwarz, 2007). Beyond these divergent research claims, which are somewhat outside the scope of this study, researchers seem to agree that the concept of attitude implies that there is a key evaluative response or position that gets triggered for individuals in a wide range of situations (Gawronski, 2007). This key contention is one that informs the conceptualization of design attitude that we present in this study. Thus, when we refer to

“attitude” in this study, we are anchoring the term in the more phenomenological stream of the literature. We refer to attitude as a disposition or approach that designers or managers take that translates in a set of behaviors, which in turn connote varying capabilities.

Another departure in our definition of design attitude is that we expand the prior five dimensions proposed in the literature by adding a new dimension—systems thinking. Based on theoretical and empirical grounds, we argue that systems thinking had been missing in the conceptualization of the construct given the explanatory weight of the concept in organizational learning and social innovation literatures (Jackson, 2003; Kellert, 2009; Mulgan, 2014). Finally, we also propose slight revisions to the definitions of the five dimensions first articulated by Michlewski. The rationale for our reconceptualization of these dimensions is driven by a) the aim of capturing in as exhaustive a manner as possible the relational dimensions of the design attitude construct (MacKenzie et al., 2011), and b) by detecting design related skills and capabilities that can be operationalized for measurement to support the articulation of our final scales. In this regard, we base our definitions of the proposed six dimensions of design attitude on a broader literature review that includes domains outside design such as psychology (for empathy, for example, Gerdes, Segal, & Lietz, 2010) and systems thinking theory (Cabrera, Colosi, & Lobdell, 2008) where we found in some cases quantitative studies that allowed us to adapt validates scales. We articulate the definitions for the six dimensions in detail in the construct operationalization section of this study. Figure 7 presents the six dimensions that we tested in the study.

Figure 7: Initial Design Attitude Dimensions Tested in the Study



Conceptualization of Supporting Constructs in the Study

This section provides an overview of the theoretical underpinnings of the other constructs used in this study that are necessary to establish construct validity for design attitude. We selected these constructs for their wide use in design contexts or for their relevance and application in the specific domain of interest of this study—social innovation. Below we discuss each construct and offer the theoretical rationale to

conceptualize them in ways whereby we can hypothesize conceptual relationships between these constructs and the design attitude construct.

Design as Social Innovation

A rich body of ongoing research (initiated in 2012) on social innovation known as the TEPSIE research program, serves as important theoretical scaffolding for this study.⁸ TEPSIE is a research collaboration that aims to identify tools and methods to measure and scale the social innovation field in the European Union. The initiative signals the growing importance of re-defining social innovation in Europe as radical shifts in government policies and resources are impacting some of the established principles and benefits of many the continent's welfare states. The report openly aims to also fill a gap—given a relative lack of empirical and theoretical studies that explain social innovation phenomena globally—in our knowledge and understanding about the barriers to innovation, as well as the structures and resources that are required to effectively address contemporary social and environmental challenges. As such, the TEPSIE program has already undertaken a comprehensive literature review of the field (Davies, 2013) and is developing critical frameworks to address measurement (Bund, Hubrich, Schmitz, Mildenerger, & Krlev, 2013; Schmitz, Krlev, Mildenerger, Bund, & Hubrich, 2013). The report's multidimensional definition for social innovation is one which we adopt in this study: a new solution (product, service, model, process, etc.) that simultaneously meets a social need (more effectively than existing solutions) and leads to new or improved capabilities and relationships and better use of assets and resources (Grice et al., 2012; Moulaert et al., 2005).

⁸ For more information on TEPSIE see <http://www.tepsie.eu/index.php/summary>; all reports are available for download at <http://www.tepsie.eu/index.php/publications>.

In this context, we consider the field of “design for social innovation” as a an emergent subset of activities, i.e. ones coming into being and prominence (Williams, 1977), characterized by experimentation and a pluralism of methods and approaches (Jégou & Manzini, 2008; Manzini, 2014; Mulgan, 2014) in which the design process is spread among diverse participating stakeholders and competences (Bjögvinsson, Ehn, & Hillgren, 2012) that are directed towards processes of social change and transformation (Bund et al., 2013). Designers are re-framing problems, creating socially innovative solutions, and contributing breakthrough thinking about the ways things are done, and the way social needs are conceptualized (Grice et al., 2012). Their contributions go beyond consumer culture and market logic (Brown, 2009), and bring social significance to the practice of design (Tromp, Hekkert, & Verbeek, 2011). As illustrated by the types of projects reported in this study (see Appendix H), the space for design for social innovation is comprised of a diffused set of design practices across many disciplines and fields of application ranging from governance, policy, international development, education, healthcare, and poverty alleviation, to name but a few (Julier et al., 2014). Here, many of the scenarios and hybrid forms of practice designers encounter open up relational (Cipolla & Manzini, 2009) and deliberative situations (Buchanan, 1995) where design activity is typically conducted amidst cross-sectorial agendas (Mazé, 2014), and where the role of design is often fundamentally repositioned as a mediating, or strategic decision making and reframing tool (Boyer et al., 2011).

Team Learning

The notion of team learning aligns with a comprehensive series of studies in organizational theory and social-psychological research, where a prevalence of research

attention has been brought to questions about the complexities of group dynamics and decision-making, and how these relate to positive performance (Edmondson, 1999; Edmondson, 2003). Additionally, an important stream of studies has focused on learning that may ensue for the team unit well as for the larger context of the organization (Lowry, Romano, Jenkins, & Guthrie, 2009). Per Edmondson (2002), and Argote et al. (Argote, Gruenfeld, & Naquin, 2001), we define team learning as *an ongoing process of action and reflection, through which teams acquire, combine and apply knowledge*. Team learning implies processes that are collective and emergent in nature of (Marks, Mathieu, & Zaccaro, 2001) and occur through team interaction. In this study, we suggest that the concept plays an important role in the design domain, because we know from empirical evidence that designers practicing in the social innovation context increasingly find themselves in situations where they are performing as part of multidisciplinary teams (Mulgan, 2014), and applying skills to complete their work as members of teams which work together to achieve something beyond the capabilities of any single individual (Marks et al., 2001). In this regard, successful learning is not only determined by the design attitude approach of team members, and mastery of techniques or practices, but also, we argue, based on effective teamwork.

Process Satisfaction

Our study relies on prior research in organization theory and information systems that has focused on process satisfaction as a crucial determinant of effectiveness of teams (Reinig, 2003). Process satisfaction is viewed as a determinant of good communication quality, interaction, and work group collaboration adoption and performance (Lowry et al., 2009). Building on these streams of research, we define process satisfaction *as the*

perceived sense of value attained of the process followed, whereas process can be broadly encompassing of a range of attributes such as group collaboration, interaction and communication quality. We suggest that process satisfaction serves as an important and complementary dependent variable for our study as it allows us to measure the plausible influence that design attitude dimensions and design practices and techniques may exert on it process forms and their experience.

Knowing Through Making: Prototyping and Visualization

In the design process, prototyping and visualization are considered widely as effective techniques that allow designers to bring to life, externalize, communicate and test preliminary concepts and ideas as they emerge and are evaluated with stakeholders before any solution gets decided upon (Emilson, Seravalli, & Hillgren, 2011; Sanders & Stappers, 2008; Sanders & Stappers, 2012). In the empirical and theoretical literature, both constructs have been praised as a strengths designers bring to public and social innovation challenges for the ability these methods tend to counter stifled or linear planning and bureaucratic processes in organizations (Mulgan, 2014). We define prototyping broadly in this study as *any physical representation of a design idea that provides the means for examining design problems and evaluating solutions, regardless of the prototype's medium* (Houde & Hill, 1997); the activity typically implies a cyclical and iterative process of refining concepts with increasing fidelity and reflection (Zimmerman, Forlizzi, & Evenson, 2007) that gathers users and stakeholders in feedback rounds of exploration and clarification, transforming designers' intuitions and discoveries into stronger claims (Koskinen, Zimmerman, Binder, Redstrom, & Wensveen, 2011). We define visualization as *using images and visual thinking as aids in sense-making and*

cognitive processing of complex information, going beyond the functional level of simply representing information, but also operating as an element for analysis, synthesis and insight generation (Mendel & Yeager, 2010). This study draws from this more all-encompassing conceptualization of visualization as an integral design technique to foster experimentation and collaboration.

By defining both prototyping and visualization as *techniques* we postulate that both constructs are referring to systematic organizational methods—routines or scripts—and thus connote a procedural way of carrying tasks with a particular sense of craftsmanship that is distinct from the abilities constituted by our definition of design attitude. In the typology of social innovation that pertain to our study, prototyping and visualization are for the most part collaborative activities to engage stakeholders across organizational and community borders. These activities not only include the dyad of designer-client(s), but also users who are involved in the design process in other capacity of co-creation--people who participate as “co-designers” (Björgvinsson et al., 2012; Björgvinsson, Ehn, & Hillgren, 2010; Ehn, 2008; Sanders, 2002). In this sense, theoretical work stemming from the stream of Scandinavian Participatory Design (PD) literature (Binder et al., 2011; Björgvinsson et al., 2012; Björgvinsson et al., 2010; Ehn, 2008) has shifted attention from traditional discussions, in industrial design for example, of technology or function attributes about prototyping (and rapid prototyping techniques) and visualization, to what designers do with such tools (Koskinen et al., 2011). In this context, the “making” competency of designers is valued as a mechanism for discovering unforeseen opportunities, and exploring and mediating what alternative options may be taken forward, providing a foundation for collaboration, and building a common point of

view in team learning project situations such as the ones we are focusing on here. The concrete dimension and physicality brought forth both by visualization and prototyping as techniques allow designers to surface the “realness” of an idea—making it available for sharing and critique (Kolko, 2010); they also represent methods that can become powerful means to facilitate organizational development, sense-making and change (Weick, 1995) as they help move a group beyond talking and thinking, to making progress toward action and decision-making (Coughlan, Suri, & Canales, 2007). We argue that for the aims of this study, both constructs are important to include as they represent distinct and complementary factors to design attitude that may predict positive social outcomes of projects.

Designing with People: User Participation

In design for social innovation there are common *practices, which we define as habitual applications of ideas*, distinct from the techniques of prototyping and visualization, and different from the abilities of design attitude, that involve people in defining user needs and design opportunities, also integrating methods from adjacent domains of knowledge such as ethnography and anthropology (Halse, 2008). There is a robust stream of design research (Binder & Brandt, 2008; Mattelmäki, 2005; Sanders, 2002; Sanders & Stappers, 2012), including that of the referenced Scandinavian Participatory Design school, and practices in design (interaction and service design for example) which adhere to a diverse set of tools (user journeys, personas, scenarios, design probes, etc.) and approaches (interviews, participant observation, user research workshops, etc.) that involve people in a participatory manner. Sanders and Stappers (2008) trace the evolution of this progressive emphasis of user as “subject,” to user as

“partner,” and make some distinctions that have occurred since the 1970s in a shifting and varied landscape of design research and practice that is becoming increasingly complex and purpose-driven. In today’s many professional design fields, as with in design for social innovation, empathic engagement with users becomes the source for critical insights that capture people’s concerns and aspirations in open-ended processes of innovation and collective co-creation that are profoundly reshaping processes of co-design and co-production in the public and social sectors (Jégou & Manzini, 2008; Staszowski & Manzini, 2013). In this framework, co-design activities represent one key strategy adopted to increase the effectiveness of supporting social innovations (Cantu & Selloni, 2013). Furthermore in the past decade, terms such as design thinking and human centered design (Brown, 2009), are steadily gaining prevalence in social and public sectors (Bason, 2010) outside the culture of many private firms that have successfully adopted them earlier (Martin, 2009); they are readily associated with processes of innovation and creativity, and imply a user participation framework with users keenly engaged in the design processes that have designers and professionals playing key orchestration and facilitation roles (Murray et al., 2010). While we rely on this body of research and practice for our study, since it captures many of the circumstances of our survey respondents, prior research by information system scholars Hartwick and Barki (Barki & Hartwick, 1994; Hartwick & Barki, 2001) also informs our conceptualization of user participation. These authors put forth four dimensions of user participation (communication, hands-on activity, influence and responsibility) that align well with design processes and have been validated through quantitative analysis; we can observe them in fairly clear-cut ways in design practice: 1) emphasis on communication with

users at key junctures before a design proposition is completely coherent or final; 2) hands-on joint activities in the conceptual development, prototyping, and testing process of a design proposal or intervention; 3) the recognition of users' influential role throughout; and 4) users' responsibility for the concrete outcomes that ensue from a design brief—i.e., enough ownership of the intervention (product, communication, service or system) to adopt or adapt it as necessary.

Design Fluency

In this study, and based on empirical evidence, we argue that the application of design attitude and design techniques and practices in the context of social innovation may vary in effectiveness depending on the level of proficiency or mastery that the designer may have. We define this concept as *design fluency, or the quality or condition of demonstrating expertise in design*. We introduce the construct of design fluency as a control in the study in order to gage how much the level of design proficiency of our survey respondents may, or may not, also have in accounting for positive results.

Hypotheses Development and Conceptual Model

Building on the constructs theorized, we hypothesize relationships, which allow us to establish the nomological validity of design attitude, substantiate the directions for our hypotheses development, and develop a conceptual model that presents the opportunity to test the predictive validity of design attitude and its direct effects within the larger framework of design practice. Given that our core construct design attitude has never been rigorously operationalized, arriving at measurement for this aggregate construct has presented challenges, and key conceptual relationships with other constructs have been difficult to establish and verify. Therefore, we investigate direct relationships among all

constructs in the study to provide a basis for analyses that can be generalized in the future as part of our contribution in establishing construct validity for design attitude. As such, we articulate a conceptual model that integrates the direct effects of design attitude with factors we argue may be influential. These are represented by common design techniques (prototyping and visualization) and practices (user participation in the design process) that together, we posit also may contribute to observed impact on social innovation outcomes, team learning and process satisfaction.

Design Attitude

Given the gap in measurement of design attitude, we present the following essential series of hypotheses: we predict that the cognitive abilities and skills encompassed by design attitude, and that designers exhibit and apply to projects, have a positive relationship with team learning, process satisfaction and social innovation outcomes. These relationships have been observed from an empirical perspective and thus have strong theoretical justification as we expanded above (Boland & Collopy, 2004; Michlewski, 2008). We thus posit that:

Hypothesis 1a. There is a positive relationship between design attitude and social innovation outcomes.

Hypothesis 1b. There is a positive relationship between design attitude and team learning.

Hypothesis 1c. There is a positive relationship between design attitude and process satisfaction.

Visualization and Prototyping

Following the work of Sanders and Stappers (2008) and Björgvinsson, Ehn, and Hillgren (2010), discussed in the previous section, visualization and prototyping are

design techniques that are integral to fostering experimentation and collaboration in a social innovation context. In the hypotheses that follow we contend that these unique techniques that we associate with designers' relational and generative modes of engagement have a direct positive impact on team learning and social innovation project outcomes. We do not posit a relationship of these techniques with process satisfaction, as there is no theoretical basis in the literature to substantiate them. More importantly the relationships with team learning and social innovation give context to our design attitude hypotheses and add to the strength of our conceptual model. Accordingly, we posit that:

Hypothesis 2a. There is a positive relationship between prototyping and social innovation outcomes.

Hypothesis 2b. There is a positive relationship between prototyping and team learning.

In addition, we posit that:

Hypothesis 3a. There is a positive relationship between visualization and social innovation outcomes.

Hypothesis 3b. There is a positive relationship between visualization and team learning.

User Participation

Taking the framework of Hartwick and Barki (Barki & Hartwick, 1994; Hartwick & Barki, 2001), we next argue that user participation will have a beneficial impact on social innovation project outcomes, team learning and process satisfaction. Because user participation may affect the relationships already posited above, we theorize that user participation will have complementary relationships to design attitude. We thus posit that:

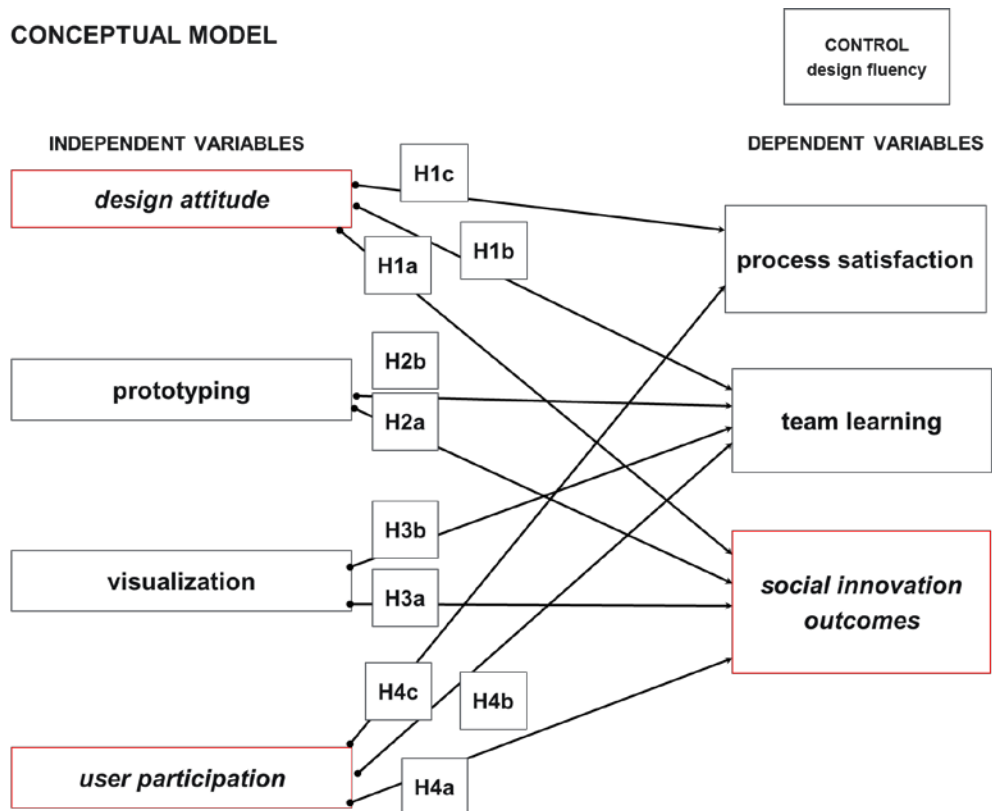
Hypothesis 4a. There is a positive relationship between user participation and social innovation outcomes.

Hypothesis 4b. There is a positive relationship between user participation and team learning.

Hypothesis 4c. There is a positive relationship between user participation and process satisfaction.

Figure 8 shows our conceptual/research model based on the hypothetical relationships we posit between the constructs of design attitude, prototyping, visualization and user participation with social innovation outcomes, as well as with team learning, and process satisfaction, including the control variable, design fluency.

Figure 8: Research/ Conceptual Model with Hypotheses



Research Design and Methods

In light of the near-absence of established quantitative frameworks to assess social innovation design, the principal aim of our research design and methods focused on creating new psychometric scales for design attitude, as well as developing new, or

adapted scales for three key constructs in the study that represent design techniques (prototyping and visualization) and design practices (user participation) that we theorize also play an essential and complementary role to that of design attitude in accounting for the effectiveness of designers' interventions in the social innovation context. In addition to establishing the nomological validity of design attitude, a secondary aim of our research design was to generate a research model and hypotheses that would provide the opportunity to test relationships that would probe the predictive validity of design attitude in the same domain and help explain how design attitude relates to social innovation outcomes, process satisfaction and team learning.

In this section, we first describe our construct operationalization methods to develop our scales, we then offer an overview of the methods we followed to further develop, test, and refine our instrument, which we deployed as an electronically disseminated, internet-based, self-administered survey within a diverse population of designers (design educators, practitioners, and students) as well as a smaller sub-population of non-designers who regularly engage in design projects. Next, we describe the steps we took for the screening of our dataset, and conclude by articulating the step-by-step statistical analyses we followed to arrive at our measurement model.

Construct Operationalization

Unlike the organizational domain where empirical studies often use quantitative methodology (Baruch & Holtom, 2008) the quantitative inquiry method is not one as favored in the field of design research and social innovation design. In part as a symptom of the relative newness of our study's focus and the paucity of quantitative research in our domain, we had to delve deep into the extant literature of adjacent domains of

knowledge to identify scales that could be adapted for the purposes of our study. In some instances, this meant that we had to carry out significant modifications based on an intuitive process of theorizing to translate constructs into operational terms. This process entailed developing appropriate conceptual definitions that would a) be understood by, and resonate with our population of interest, b) include items that would actually measure what our model purports to measure (MacKenzie et al., 2011). For three constructs in our study—i.e. team learning, process satisfaction and user participation—we were able to adapt already existing scales; we created and developed new psychometric scales for the remainder constructs, in some cases also adapting validated scales for the six dimensions of design attitude that we propose. We expand on this process of scale development below. Except for the multi-dimensional, second order constructs of design attitude, social innovation, and user participation, which we treated as formative constructs in our model, all scales were defined with reflective items (Jarvis, MacKenzie, & Podsakoff, 2003). Appendix D presents all survey items with corresponding codes; including items that were dropped from the original scales. We will first discuss how we developed the new scales and then review the adapted scales.

New scales for the Design Domain

Design Attitude (Formative/ Aggregate)

As noted in our theory section, we adapted and refined Michlewski's conceptual framework of five key attributes of design attitude into a new quantitative scale for design attitude. Although Michlewski, as well as Buchanan's extension consider these five theoretical categories to be exhaustive, and jointly comprise the whole of design attitude, we also theorize a sixth construct to ensure we capture a component we argue

was missing from design attitude, i.e. systems thinking. We operationalized each of the six categories of design attitude into separate concepts that define each dimensions in unambiguous terms as observable, measurable phenomena and adapted scales and related items from other validated scales for each dimension whenever possible. For each item in the design attitude scale's six dimensions, the scale provided a clear explanation of the reference object: the design project ("In general when I engage in a design project"). Our construct operationalization process resulted in the following articulation of scales:

- **Ambiguity tolerance (AT) (Reflective, 6 items; 2 reverse coded).** This construct is founded on Michlewski's (2008) empirically proposed category of "embracing discontinuity and open-endedness", which he further simplified as "embracing uncertainty" in his 2013 instrument. Consistent with prior research in psychology by Furnham and Ribchester (1995) and McLain (1993, 2009), in our conceptualization, the construct refers to the way an individual perceives and processes information about ambiguous situations or stimuli when confronted by an array of unfamiliar or complex clues. Specifically, it measures an individual's openness to discontinuity, the ability an individual may have to embrace change, be willing to take risks without fully knowing the outcomes (Buchanan, 2009), and be exploratory when faced with complex or unfamiliar situations and stimuli. Furnham and Ribchester offer an extensive literature review of ambiguity tolerance in the psychology domain, and reference four prior studies where ambiguity tolerance is alternatively treated as a cognitive process or as a personality trait, each with reliability measures varying from $\alpha = 0.58$ to $\alpha = 0.89$; while the authors note that

values below 0.70 are considered low, but do not consider this an issue with their analyses. We also consulted McLain who identified three alternative measures of ambiguity tolerance, each with reliabilities varying from $\alpha = 0.58$ to $\alpha = 0.71$. Although we follow this prior research to refine our scales, we note these low reliabilities as potential problems in our exploratory factor analysis as convergent validity has not been necessarily established in these two studies. We ultimately measured ambiguity tolerance with six items ($\alpha = 0.711$) that relate to design (for example, “*I am drawn to ambiguous situations that can be interpreted in more than one way*”).

- **Engagement with Aesthetics (EA) (Reflective, 6 items).** Our conceptualization of “engagement with aesthetics” departs from Michlewski’s category of “engaging poly-sensorial aesthetics,” which he further defined as “using the power of the five senses” in his 2013 instrument, underlying designer’s sensory abilities for perceiving, uncovering and translating information through the five senses. Buchanan extended the category by adding an emphasis on the visual dimension “willing to visualize and explore all of the senses in seeking solutions.” Our construct focuses instead on measuring the dimension of design attitude that assesses a designer’s orientation towards integrating aesthetics in design, recognizing beauty as a door to function and service. Thus, we assess aesthetics as a notion that includes considerations of form, function and purpose in design. Our conceptualization of engagement with aesthetics led us to conduct an extensive literature review in the design domain, which has an important

tradition of relating aesthetics to the acts of design production and its connections to usability, ergonomics, function and goodness (Norman, 2002). In this stream, the term aesthetics is generally employed as the *objective* feature of a stimulus (e.g. color of a product) or as the *subjective* reaction to a particular artifact. Furthermore our conceptualization of aesthetics is founded on John Dewey philosophical work, specifically in how he refers to the aesthetic dimension as one capturing perception and enjoyment of human experience (Dewey, 1934). The theoretical literature that supports our conceptualization and item generation of engagement with aesthetics is qualitative in nature and thus does not provide reliability, or validity statistics. We recognize the limitations of this. For our measures we can demonstrate reliability for engagement with aesthetics ($\alpha = 0.694$), which is acceptable if not ideal in the context of this study. The six items in our scale relate engagement with aesthetics with the process of designing (for example: “*I try to balance formal beauty and usability equally when I design*”).

- **Systems Thinking (ST) (Reflective, 6 items).** Our conceptualization of this dimension of design attitude assesses an individual’s capability to identify their work as part of a holistic system (recognizing the parts from the whole) where feedback loops may impact final outcomes. The scale captures the extent to which individuals approach problems and design solutions with an appreciation for seeing parts in a holistic system; and recognize their role within a complex system that is dynamic, constantly changing, and governed by history and by feedback (Cabrera et al., 2008; De Savigny & Adam, 2009).

The systems thinking concept was not originally included in Michlewski's conceptualization, but it is implicitly stated when he talks about "connecting multiple perspectives" dimension and refers to the ability of designers of "seeing holistically" (Michlewski, 2007). We chose to differentiate this aspect in this study, and include systems thinking as an additional dimension onto itself since it has been theoretically justified and observed in the organizational literature (Cabrera et al., 2008). For our development of items we integrated items from an instrument rigorously validated in a very different domain, healthcare, by Case Western Researchers: the Systems Thinking Scale (STS) (Dolansky & Moore, 2013). Dolansky and Moore demonstrate reliability (α from 0.54 to 0.89), although they note some values are low and may indicate validity issues. However, the authors do demonstrate convergent and discriminant validity with their scale items. In our six-item scale for systems thinking, we adapted this systems thinking healthcare conceptualization from Dolansky and Moore to a design domain; our reliability was on the threshold of acceptability ($\alpha = 0.660$); an item from our scale is: for example: *"I believe recognizing how the parts of a project fit in the whole context matters"*.

- **Connecting Multiple Perspectives (CP) (Reflective, 7 items).** Our conceptualization is consistent with prior research (where the construct is referred to as "consolidating multidimensional meanings," (Michlewski, 2008) and "connecting multiple viewpoints and perspectives" (Michlewski, 2013 instrument), and "ability to see the whole situation," Buchanan (2009,

unpublished). Our construct measures an individual's capability to consolidate multi-dimensional meanings, i.e. making connections, recognizing patterns, and reconciling analytic and synthetic perspectives. Given the strong conceptual basis of this construct with the design domain, we based our scale primarily on Michlewski's 2013 instrument for which no reliability measures have been published. However, we established reliability ($\alpha = 0.843$) for the construct indicating high reliability. An example item of the seven-item scale is: *"I seek as many perspectives as possible to find the right solution."*

- **Creativity (C) (Reflective, 5 items).** Michlewski does not specify creativity as a construct and instead offers "creating, bringing to life," as a theoretical category that he further refines as "playfully bringing things to life" in his 2013 instrument. Buchanan's extension (2009, unpublished. See Appendix A) for this dimension emphasizes the human sensation provoked by the creative act "delight in wonder and surprise." Because this concept is not validated or well defined quantitatively, we opted to define this dimension of design attitude with the more established construct of creativity, which conceptually aligns with the design domain where there are extensive studies that focus on the nature and relationships of design capabilities *vis-à-vis* creativity (Dorst & Cross, 2001). We define our construct of creativity following the definition of (Amabile, 1996) as "the capability to produce novel and useful ideas." We also consulted Zhou and George (George & Zhou, 2001; Zhou & George, 2001) to create this scale as these authors conceptually relate creativity behavior to a domain that we argue manifests as well in design: openness to

experience and conscientiousness which these authors assess as important antecedents to creativity and innovation outcomes, providing validated creativity measures with very high reliability ($\alpha = 0.96$). We adapt our five item scale for creativity from this previous work and ensure it resonates with the design domain; a sample item of our scale is: “*I delight in creative action.*”

- **Empathy (E) (Reflective, 8 items).** The construct builds on prior research (“embracing personal and commercial empathy” (Michlewski, 2008) refined as “engaging in deep empathy” in his 2013 instrument and “empathy with the human side” (Buchanan, unpublished 2009. See Appendix A) where this dimension of design attitude has been validated by empirical work and construed as the skill designers have to communicate, do “deep listening” and “concentrate on people and human-centeredness.” Our study departs from prior conceptualizations of empathy that had an emphasis on customers and commercial interests. Instead, we assess empathy as the ability of the designer to arrive at a deep understanding of how others see, feel and experience (Brown, 2009) as well as sense “other oriented” feelings of sympathy and concern for others, balance ego, and tolerate differences. We consulted, Gerdes et al. (Gerdes et al., 2010; Segal, Cimino, Gerdes, Harmon, & Wagaman, 2013) as a foundation to create items for our scale, focusing on probing the subset of empathy defined by these authors as “mental flexibility and perspective taking” because it is a behavior typical within design. Further Gerdes et al. provide validation of their empathy scale that indicates high

reliability ($\alpha = 0.809$ to $\alpha = 0.831$). We established high reliability ($\alpha = 0.832$) in our eight-item scale which is adapted to design domain; an example item is: “*I relate to the aspirations of others.*”

Social Innovation Project Outcomes (SI) (Formative)

We created measures across two key dimensions of social innovation in the empirical literature based on the TEPSIE research program’s *Blueprint for Social Innovation Metrics*, (Grice et al., 2012; Schmitz et al., 2013). We chose the following two dimensions of social innovation, because they are critical for the purposes of our study: novelty and social impact. As the TEPSIE research program report’s literature review makes clear, there is a pluralism of definitions of social innovation and this multidimensional construct can be captured with a variety of dimensions that are sometimes interrelated. For the purposes of our study we choose the two most relevant dimensions to the design domain that are we able to be quantitatively measured within the boundaries of our instrument. For example “effectiveness,” and “the implementation process” are important dimensions of social innovation that are commonly cited, but we argue that they are captured more rigorously (respectively) by the dimension of “societal impact” in the social innovation construct and by the construct of “process satisfaction” that we include in this study. We created the scales for this ten-item construct based on the empirical literature in social innovation and design.

- **Novelty (N) (5 items, Reflective).** The construct measures the criterion of invention and originality of project outcomes. There was no previous information available on reliability of construct validity for novelty. However, we were able to establish high validity and reliability of novelty in our study

(novelty, $\alpha = 0.717$ and social impact, $\alpha = 0.785$). An example item for novelty is: *“the design resulted in novel outcomes.”*

- **Societal impact (SI) (5 items, Reflective).** The construct measures the ability, or perceived potential, of project outcomes to fulfill unmet social needs of stakeholders and yield improvement. We did not find studies with available reliability or construct validity measures for societal impact. However, we were able to establish high validity and reliability in our study (societal impact, $\alpha = 0.785$). An example item from our scale for societal impact is: *“the design was an opportunity to fulfill unmet needs”*.
- **Prototyping (P) (Reflective, 6 items).** The construct measures prototyping as a making technique or method regularly employed by designers and defined as the activity of creating tangible expressions of ideas, “building to think;” testing ideas over multiple iterations and trial-and-error, and learning fast by failing early (Coughlan et al., 2007; Sanders & Stappers, 2012). We created the scales for this six-item construct based on the empirical literature in design since no quantitative measures exist for the construct to the best of our knowledge. Thus no previous information is available on reliability or construct validity. However, we were able to establish high validity and reliability for prototyping ($\alpha = 0.831$). An example item is: *“I find that trying out multiple iterations of ideas as early as possible makes for good design.”*
- **Visualization (V) (Reflective, 7 items).** The construct measures visualization as an essential method used by designers who give visual form (e.g. via diagrams, sketches, graphs, visual maps, etc.) to information in order to

crystallize ideas, facilitate and constrain inference, problem-solving and understanding, and communicate ideas with stakeholders (Sanders & Stappers, 2012; Suwa & Tversky, 1997). We created the scales for this seven-item construct based on the empirical literature in design since no quantitative measures exist for the construct of visualization to the best of our knowledge. Thus no previous information is available on reliability or construct validity. However, we were able to establish high reliability for visualization ($\alpha = 0.848$). An example item is: *“I find that visualization helps stakeholders better understand the impact of the proposed solution.”*

Adapted Scales

User Participation (UP) (Formative)

This multi-dimensional construct measures the extent to which users are involved in the design solution developed; acting as “co-designers,” and carrying out activities and communicating with the design team during the project (Sanders, 2002). In order to operationalize the construct, we adapted the four distinct dimensions of user participation developed by Hartwick and Barki in the information systems domain: responsibility, hands-on activity, communication, and influence (Barki & Hartwick, 1994; Hartwick & Barki, 2001). These authors have demonstrated high reliability for each of the four dimensions of user participation: responsibility ($\alpha = 0.88$), hands-on activity ($\alpha = 0.77$ and $\alpha = 0.81$), communication ($\alpha = 0.85$ and $\alpha = 0.87$), and influence ($\alpha = 0.84$). In their studies, Hartwick and Barki also demonstrate discriminant and convergent validity for all four dimensions of the user participation construct. In our operationalization of user participation, we captured responsibility with four items (for example: “users were

key partners of the design team in developing the final solution.”); hands-on activity was captured with two items (for example: *“during the exploration and conceptualization phase of the project, users were involved in co-creation activities”*); communication was captured with four items (for example: *“users communicated with our team at key junctures of the process”*); influence was also captured with four items (for example: *“users’ input was influential in driving the vision for the design concept selected”*).

- **Team Learning (TL) (Reflective, 7 items).** The construct measures how learning emerges in terms of structure and function to transform from an individual experience to a collective (team) phenomenon. We conceptualize team learning as an ongoing process of action and reflection (Edmondson, 2002), through which teams acquire, combine and apply knowledge (Argote et al., 2001). We adapted the validated measures developed by Kostopoulos et al. (Kostopoulos, Spanos, & Prastacos, 2013) that treats team learning as an emergent, multilevel phenomenon that includes four basic dimensions and socio-cognitive processes of learning (i.e. intuition, interpretation, integration and codification). We found particular synergy for our study in these authors’ scales given that they were developed and validated in three independent field studies of innovation and project teams, where learning evolves through team interactions. Further, the authors establish high reliability for their scales of team learning ($\alpha = 0.86$ to $\alpha = 0.93$). In addition, the authors establish discriminant and convergent validity for their scales. For the purposes of our study, the seven items in our scale capture the processes of learning by which teams ask questions, seek feedback, challenge underlying assumptions,

improvise, and reflect on specific results and unexpected outcomes; an example item from our scale is: “*in our team, members typically combined and synthesized ideas.*”

- **Process Satisfaction (PS) (Reflective, 5 items, 1 reverse item).** The construct measures the extent to which participants perceived value with the processes (communication, interaction, collaboration) that characterized the project they report on. We define satisfaction (affect) to be caused when an individual perceives that an object (generally understood as actions, attributes, processes, situations, ideas, persons) facilitates, or hinders, the attainment of value. We consulted the validated scales ($\alpha = 0.76$ and $\alpha = 0.79$) developed by Reinig in the information systems domain since this instrument ascertains satisfaction with process and outcomes of teamwork (Reinig, 2003); we also adapted process satisfaction scales measuring group collaborative system adoption, continuance and performance by Lowry et al. (Lowry et al., 2009) due to their scales high reliability measures ($\alpha = 0.800$ to $\alpha = 0.943$). An example of our five item scale is: “*I found our process satisfying.*”

Design Fluency: Control Variable

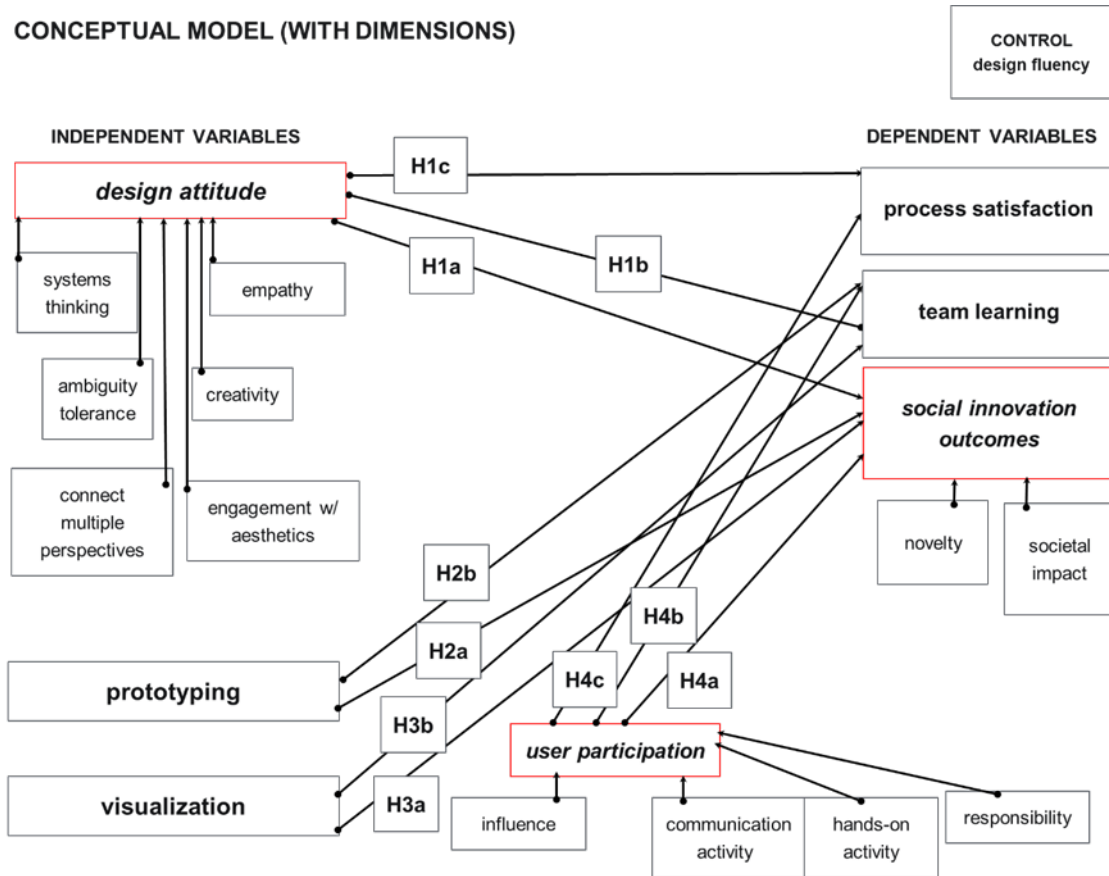
We controlled for one key concept given the theoretical underpinnings of our study: “design fluency,” which we defined as the degree of design know-how that participants in the study reported; we measured design fluency in a scale ranging from 1 to 5 (with 1 indicating the least amount of design fluency, and 5 the most design fluency). Users self-reported design fluency on this five level range. We chose design fluency as a

control to also capture more traditional control variables such as age and education and professional background in order to minimize extraneous variables in the study.

Further, although not treated as controls in our model, we collected data in the survey that include the five known determinants of learning and teamwork in knowledge intensive environments (Davenport, 2005): age, gender, experience in the work environment, employer, and formal education. Since we were measuring respondents' perspectives relating to a self-reported experience with a recent project, we also collected data that allowed us to retrieve information about the scale of the project, the duration of the project and project typology (See Appendix H for graphs that offer analyses of this data).

Figure 9 shows our conceptual model and hypotheses with constructs and dimensions.

Figure 9: Conceptual Model with Dimensions and Hypotheses



Survey Development

To determine the overall validity of design attitude, we designed a quantitative survey that framed questions for participants as an examination of their key capabilities, as well as their approaches applying these to a recent project. The online survey utilized Qualtrics, a popular online survey research platform. The questionnaire included a two-prong structure: in part one, our aim was to measure participants self-reported design behaviors and abilities (design attitude), and in part two, our objective was to uncover relationships with their experiences in deploying common design techniques and practices, and their self-assessment of impact applying design abilities and these

techniques and practices to projects. In particular, our questions in this second half of the survey were designed to measure the role of prototyping and visualization and user participation in social innovation, and their influence on team learning and process satisfaction of the project reported. Finally, we designed an additional set of questions in this section to assess survey participants' plausible perception(s), or knowledge of, the reported project's novelty and beneficial social impact in order to measure social innovation project outcomes. Thus the introductory stem of the survey informed participants in the study that there were two different set of questions they would be asked: 1) an initial set of questions (randomized) that would probe their *individual* and current approach to design, and 2) a second set of questions that would ask of them to think back to the most recent project that included a significant design element and a goal for social impact, or innovation, and reflect on their personal assessment of those outcomes, as well as on team learning and process satisfaction.

Questionnaires can provide insight into individual perceptions and attitudes as well as organizational practices (Baruch & Holtom, 2008). The design of the questionnaire's procedures (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) can play an important part in accounting for the strength of the questionnaire in observing patterns and evaluating progress of phenomena. In this study, in order to facilitate the comprehension of questions by respondents and following best practices on questionnaire design, we kept the introductory statements of the survey to a brief manageable length, and questions were constructed to be in the active voice, as clear, concise, and relevant to the study as possible (Lietz, 2010), with question statements within the 20 word recommended length (Oppenheim, 1992). When adapting scales, we generally avoided

negatively worded questions as they take longer to process by respondents (Belson, 1981; Foddy & Foddy, 1994). With regards to question order, we placed general statements prior to more specific ones in each section and demographic information was presented at the end to avoid potential negative feelings that personal information may solicit in impacting on participation or the answering behavior of respondents (Lietz, 2010; Sue & Ritter, 2012).

For all constructs we chose to include, adapt, or create scales on a 5 point Likert scale which has been shown to be reliable (Cronbach, 1951) as it allows for differentiation in responses, and is appropriate in situations such as this survey, where more abstract judgments are sought from respondents (Foddy & Foddy, 1994; Lietz, 2010). Our scales are unipolar with matching verbal labels as anchors, mentioned explicitly on both ends of the scale. Per Rammstedt and Krebs (2007), we ensured that the strongly agree option corresponded with the highest numerical value (=5) and the “strongly disagree,” option to the lowest numerical value (=1). We included middle options in all scales because they are found to increase the validity and reliability of response scales slightly (Lietz, 2010).

Instrument Validation and Refinement

After our generating or adapting items to represent the constructs in our study, we assessed their content validity as described previously, and then moved on to refining the scales using scale development guidelines (MacKenzie et al., 2011). We first consulted with five experts (a mix of academics and practitioners) in management, design, and social innovation that provided a range of very specific notes about wording of scales that

made the instrument more robust in terms of clarity, reliability, and content validity.⁹ Next, we submitted our instrument to two rounds of Q-sorting methodology pretesting (both in person and via email) (Thomas & Watson, 2002) with a diverse pool of participants selected from our population of interest; this sorting methodology was effective in allowing us to confirm that our interpretative preconceptions as researchers were confirmed by respondents' own logic and analysis of the statements representative of our constructs (Thomas & Watson, 2002). In the first round of Q-sorts, subjects identified readily with statements for ambiguity tolerance, connecting multiple perspectives, engagement with aesthetics, visualization, prototyping and process satisfaction (statements corresponding to our items for these constructs were recognized at an 88% to 100% rate). For the remainder constructs, we refined items by rewording to avoid confusion (e.g. four items in our creativity scale were initially confused with systems thinking) and sometimes by dropping items altogether (e.g. we deleted one item in social innovation outcomes because it did not capture the distinct dimensions of novelty and societal impact). After these refinements, the second round of Q-sorting yielded 88% to 100% scores among respondents for all items retained in the instrument.

Finally, we used Bolton's methodology (Bolton, 1993) to test the instrument face-to-face with colleagues in the design for social innovation field. The Bolton protocol was particularly valuable in helping us diagnose an apparent relative difficulty that pilot respondents had in answering with confidence the questions related to the social

⁹ We are grateful to Dr. Richard Boland and Dr. Fred Collopy, Weatherhead School of Management, Case Western Reserve University, for their early review of the instrument. We are also indebted to Ric Grefé, Executive Director, AIGA; Jocelyn Wyatt, Executive Director, IDEO.org and Lee Davis, Co-Director, Center for Social Design, Maryland Institute College of Art (MICA), for their generous and attentive feedback in validating the instrument.

innovation project outcomes section of the instrument; we thus refined the introductory statements of this portion of the questionnaire to strive for more clarity and ease for respondents to retrieve from memory and process examples about their perceptions and self-assessment of social innovation outcomes from their projects.¹⁰ The final survey items are shown in Appendix D.

Data Collection, Sample and Data Screening

Our instrument was deployed nationally launching the first week of February 2014 with the endorsement of the professional design association (AIGA). AIGA circulated the survey to its membership for consideration with a letter from its president. In addition, we personally reached out to a professional network of approximately 200 design practitioners and educators active in the design for social innovation field, many of whom we had previously convened in a national symposium in fall 2013 (*LEAP: The New Professional Frontier in Design for Social Innovation*, Art Center College of Design, September 19-21st, 2013).¹¹ We also deployed the survey internationally through a series of design practitioner and academic networks where the researcher is an active member, including Cumulus: the International Association of Universities and Colleges of Art, Design and Media; the Design Management Institute (DMI), and the international Design Research mailing list. Finally, the survey was also a featured entry in a number of LinkedIn design groups. We took deliberate steps to market the instrument and discuss the aims of the research and the relative novelty of the quantitative methods used by

¹⁰ Our appreciation is extended to Jennifer May, Associate Director, Designmatters; Penny Herscovitch and Daniel Gottlieb, Faculty, Environmental Design, Art Center College of Design, and colleagues and students at Art Center College of Design and the University of Southern California Marshall School of Business, Brittingham Social Enterprise Lab, for the valuable feedback they provided about the instrument in Q-sorts and Bolton phases.

¹¹ For an overview of the LEAP symposium see www.leapsymposium.org

authoring a blog about the aims of the research. This blog was disseminated widely in two prominent design news digital outlets, newsletters, and their associated twitter feeds, with the support of its editors: Public Interest Design and Good.¹²

Participants were assured that completing the questionnaire was voluntary and that their data would remain confidential. In a first round of data collection, which we closed in mid- March after participants were sent one reminder three weeks into the survey's launch, we had 424 surveys. Our data screening analyses reduced the dataset to 141 completed surveys. By parceling the data between the two distinct sections of the questionnaire, we were able to confirm that the first set of questions in the survey, the design attitude section, received a higher rate of completion, with 232 completed responses.

In order to test for non-response bias we compared the responses of the survey before any reminder was sent with those who responded in the last week of this first round. We compared the mean and the mode of those two groups for all construct items and found less than one point modal difference and less than a .5 mean difference, which allows us to conclude that non-response in the survey was mainly due to chance and likely not to non-response bias.

We did a second round of data collection from mid-March to late April 2014, issuing one reminder to participants mid-way, in order to increase number of responses for analysis purposes. We collected in this round another 282 surveys, and retained 92 for

¹² These blog posts can be found at <http://www.publicinterestdesign.org/tag/designmatters/> and <http://magazine.good.is/articles/the-return-on-design-in-the-public-sector-requires-that-we-analyze-its-effectiveness-first>. The researcher is grateful to John Cary and Katie Capreau from Public Interest Design, (now the Autodesk Foundation's Impact Design Hub), Alessandra Rizzotti from GOOD, and Anne Lyon from the Design Management Institute for their support in promoting the instrument.

analysis after data screening and deletion of incomplete surveys. We parceled the data between the two sections of the questionnaire and arrived once again at a higher rate of completion for the design attitude section with a total of 137 surveys. Between both rounds of data collection overall we could secure a total of 233 complete surveys (i.e. with 100% completed responses for the entire questionnaire), the instrument thus yielding a 32% response rate for a total of 701 surveys taken (which is acceptable, since it falls within one standard deviation of the mean for academic response rates studied in 2005 (Baruch & Holtom, 2008). We arrived at a total of 370 surveys that had complete responses for the design attitude section of the questionnaire (yielding a 53% completion rate—we theorize about this higher rate of completion of the design attitude questions in the discussion section of the paper). After imputation of medians to missing data points, we retained for analysis a complete dataset of 233 data points for the complete survey and 370 data points for design attitude.

Appendix G includes graphs and tables that provide characteristics of the 233 respondents in the study, which included designers and a sub-population of non-designers. The survey was evenly distributed between male and female participants; a majority had graduate level education. It is worth noting that participants fell on the high end of the spectrum with regards to the control in our study, design fluency.

In addition to screening for missing values in the data, we also performed other data quality checks and reviewed the descriptive statistics for the study's variables in order to identify any potential errors in data collection or entry, and to ensure that there were no "hidden" effects in the data that may have been overlooked (Hair, Black, Babin, & Anderson, 2009). We assessed normality in the distribution of the data by focusing our

analyses on outliers and kurtosis. As expected, given that our dataset sample are designers or individuals with a high degree of design fluency, we did not find a lot of variance, and most respondents tended to either agree or strongly agree with the statements in the survey in the section of design attitude variables, as well as for visualization, prototyping, and user participation--our other three independent variables. Therefore, our analyses show large values for both negative skewness and for positive kurtosis (i.e. kurtosis greater than 1; skewness less than -1); this supports our expectations from a theoretical perspective: the responses are not normally distributed (and therefore there is kurtosis across variables), because respondents are likely to cluster around one end of the spectrum of responses. Because of this we also chose to set higher threshold outlier elimination: we only considered eliminating responses, if they could be identified as outliers in several of the constructs. During our data screening process, we did not find any data points that met this higher threshold for elimination.

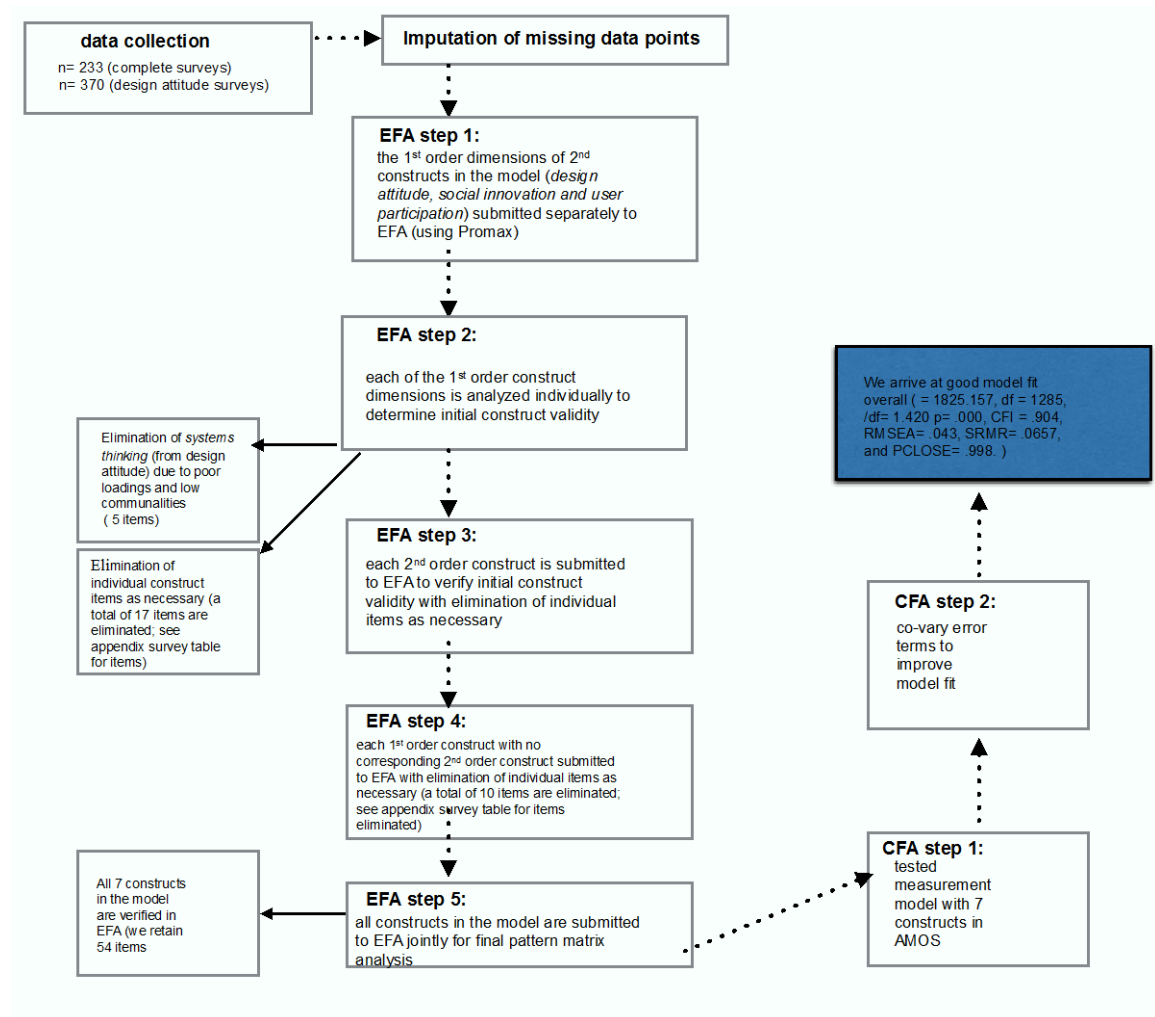
Measurement Model

Exploratory factor analysis. The initial 87-item scale in our study was submitted to an exploratory factor analysis (EFA) using oblique rotation (Promax), because the factors were correlated, and the technique is appropriate for the size of larger datasets such as ours (n= 233 for total complete survey and n= 370 for completed design attitude surveys).

Since our conceptual model includes three second order formative and multidimensional constructs (design attitude, user participation and social innovation) and because we parceled the data between design attitude and the remainder of the factors in the instrument, we proceeded with an iterative process for EFA, running separate EFA

analyses for each construct in the dataset before arriving at a final EFA analysis. Figure 10 illustrates the EFA and CFA step-by-step process we followed which we expand upon below.

Figure 10: EFA and CFA Steps Diagram



We first conducted a separate EFA for each first order construct within design attitude (diagram EFA step 1), examining the underlying structure of each factor (ambiguity tolerance, systems thinking, empathy, engagement with aesthetics, creativity, connecting multiple perspectives) and carefully assessing when to delete items for each

of these constructs by examining communality thresholds, cross-loadings, and balancing the theoretical weight of each item before deciding to trim (diagram EFA step 2). We adhered to the following statistical guidelines in this process: we retained the items that a/had high loadings on their primary factor, i.e. above 0.30 (MacCallum, Widaman, Zhang, & Hong, 1999), and b/ that had low cross-loadings on any other factor (i.e., cross-loadings were less than half of their primary loadings; Hinkin, 1998); we also aimed to retain at least the recommended minimum of 3 items per factor (Thompson & Daniel, 1996). Also, we noted at this stage of the analysis that creativity and aesthetics exhibited potentially problematic cross-loadings with other factors, but we choose to proceed given the theoretical weight of these items for our study. We then ran an EFA for design attitude with trimmings and adequate factor loadings for each first order factor. This second order EFA for design attitude (diagram EFA step 3) resulted in us having to delete the systems thinking construct altogether, because it did not load appropriately onto any factor, and all its items had very low communalities (we suspect that the systems thinking dimension was confused by respondents with the connecting multiple perspectives construct).

Similarly, we followed the same analyses procedures of design attitude for the other two formative factors in our dataset, social innovation project outcomes, and user participation; running separate EFA analyses for each construct within these, and then proceeding with an EFA for the second order constructs, deleting items only when necessary while weighing the plausible theoretical impact of our deletions (diagram EFA step 4). Despite a few select trimmings for both user participation and social innovation, the EFA solution for each second order construct preserved the dimensions that we had

put forward on theoretical grounds: novelty and societal impact for social innovation outcomes, and hands-on activity, responsibility, communication and influence for user participation (however these four dimensions are less distinct in our final EFA pattern matrix). As with creativity and aesthetics, novelty also demonstrated some potentially problematic cross-loadings with other factors, but we chose to proceed on theoretical grounds. We present the final EFA pattern matrix of all independent variables in the dataset in Appendix E.

We used a combination of diagnostic techniques and several statistics that we reviewed to ensure that the final EFA analysis for our measurement model was acceptable (diagram EFA step 5). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (MSA) was .832 (this result is above the threshold of acceptability, which is values above .60 to .70, per Hair 2009). The Bartlett's Test of Sphericity was significant ($\chi^2=5724.819$; $df=1378$ at $p=.000$) indicating sufficient inter-correlations and strong factorability (Hair et al., 2009). For this final EFA model the number of non-redundant residuals was less than one percent.

Reliability measures were all acceptable (see Appendix F), above 0.70, (Nunnally, 1978) or just barely below this index; we note that the two constructs just below the threshold are creativity ($\alpha=0.662$), and aesthetics ($\alpha=0.657$), which already demonstrated cross-loadings with other factors. We kept these factors as our goal at this stage was to consider multiple measures as determinant for reliability and validity assessment, remaining cognizant of the empirical and theoretical weight of the factors in the model in addition to balancing the statistical analyses (Thompson & Daniel, 1996). For our final model with second order constructs our only problematic reliability index is

for social innovation (= 0.579); Appendix F, Table F2 presents the indices with the second order constructs for our final model.

This EFA resulted in 15 factors after deletion of one first order factor (systems thinking); 32 items were removed from the item pool through the iterative process we described above. In the final model all but six items loaded greater than 0.50 (we observe that the six items slightly under the threshold correspond to factors where we saw some problematic loadings earlier at the single EFA analysis level: these are creativity, aesthetics and novelty). The communalities of all of the 54 items retained in our model were above 0.30; no item had cross loadings greater than 0.20. The final total variance explained was 56.70%. Factor correlations were almost all less than 0.70 (see Appendix F, Table F1 for 1st order analysis with exceptions, and Table F2 for 2nd order analysis) suggesting adequate initial convergent and discriminant validity. We note that given the large number of items in our instrument some factor correlations greater than 0.70 are expected, and not cause for rejecting convergent and discriminant validity of the overall model.

Confirmatory Factor Analysis

A confirmatory factor analysis (CFA) was used to assess the psychometric properties of the 15 constructs that resulted from the initial EFA (Figure 10, CFA step 1). We constructed the measurement model incorporating our three second order formative constructs: design attitude and its five 1st order factors; social innovation and its two 1st order factors, and user participation and its four 1st order factors, as well as the remainder of the constructs (prototyping, visualization, team learning and process satisfaction), thus ending up with a model with 7 final constructs.

Given the complexity of our proposed model with three second-order constructs, and the sample size with our population of interest, the overall fit of the model was excellent (Figure 10, CFA step 2), as represented by the following fit indices: $\chi^2 = 1825.157$, $df = 1285$, $\chi^2/df = 1.420$ $p = .000$, CFI = .904, RMSEA = .043, SRMR = .0657, and PCLOSE = .998. In order to make the model more parsimonious, we co-varied error terms when possible. Figure 10 presents a summary diagram of the EFA and CFA steps we described.

Appendix F, Table F2 presents descriptive statistics for the overall model with second order constructs. Due to the greater difficulty in assessing indices for second order constructs, we included in our CFA an examination of all 15 factors (see Appendix F, Table F1 for 1st order MSV and AVE analysis results). This allows us to make the following inferences about some of the less optimal results we observe:

- For social innovation: composite reliability (CR) was below the threshold of 0.70 and an average variance extracted (AVE) was less than its respective maximum shared squared variance (MSV) (Fornell & Larcker, 1981); also AVE was below the recommended threshold of 0.50. However, social innovation is a second order construct so these thresholds should be considered less strict measures due to the difficulty in measuring second order constructs. By examining the indices of the first order constructs that make for social innovation, we observe that societal impact had no issues, while novelty, showed a low AVE. This is expected, since novelty has only three items and has only 46.294% of total variance explained by those three items. The Cronbach alpha measures were acceptable for both 1st order constructs so

we do not consider the slightly low value of Cronbach alpha (< 0.70) for social innovation to be problematic.

- For design attitude: we note that AVE was less than MSV (also AVE is below threshold of 0.50); however design attitude is a second order construct so the same rationale as for social innovation applies. If we examine the first order factors (Appendix F, Table F1), we see the first order constructs for design attitude all show low AVE values, but this is consistent with the individual analysis on total variance explained in EFA for these items; as such a low AVE for design attitude is not a surprise. Also we note for most of these items that AVE is lower than MSV, except for creativity, this is again consistent with our EFA analysis. Cronbach alpha is acceptable for all but one of the first order constructs (creativity is again slightly problematic) so we do not consider the slightly low value of the Cronbach alpha measure (< 0.70) for design attitude to be problematic.
- Finally, team learning: as a first order construct in our model, it has an AVE just below threshold of 0.50; this is also consistent with our EFA analysis, since team learning has only three items and has only 49.749% of total variance explained by those three items.

Common Method Bias

Common method bias poses a potential challenge for our study because our measures are derived from a single instrument (a self-report questionnaire) which was used to collect the data for both the predictor and criterion variables that capture the individual judgments and perceptions of our population of interest (Podsakoff,

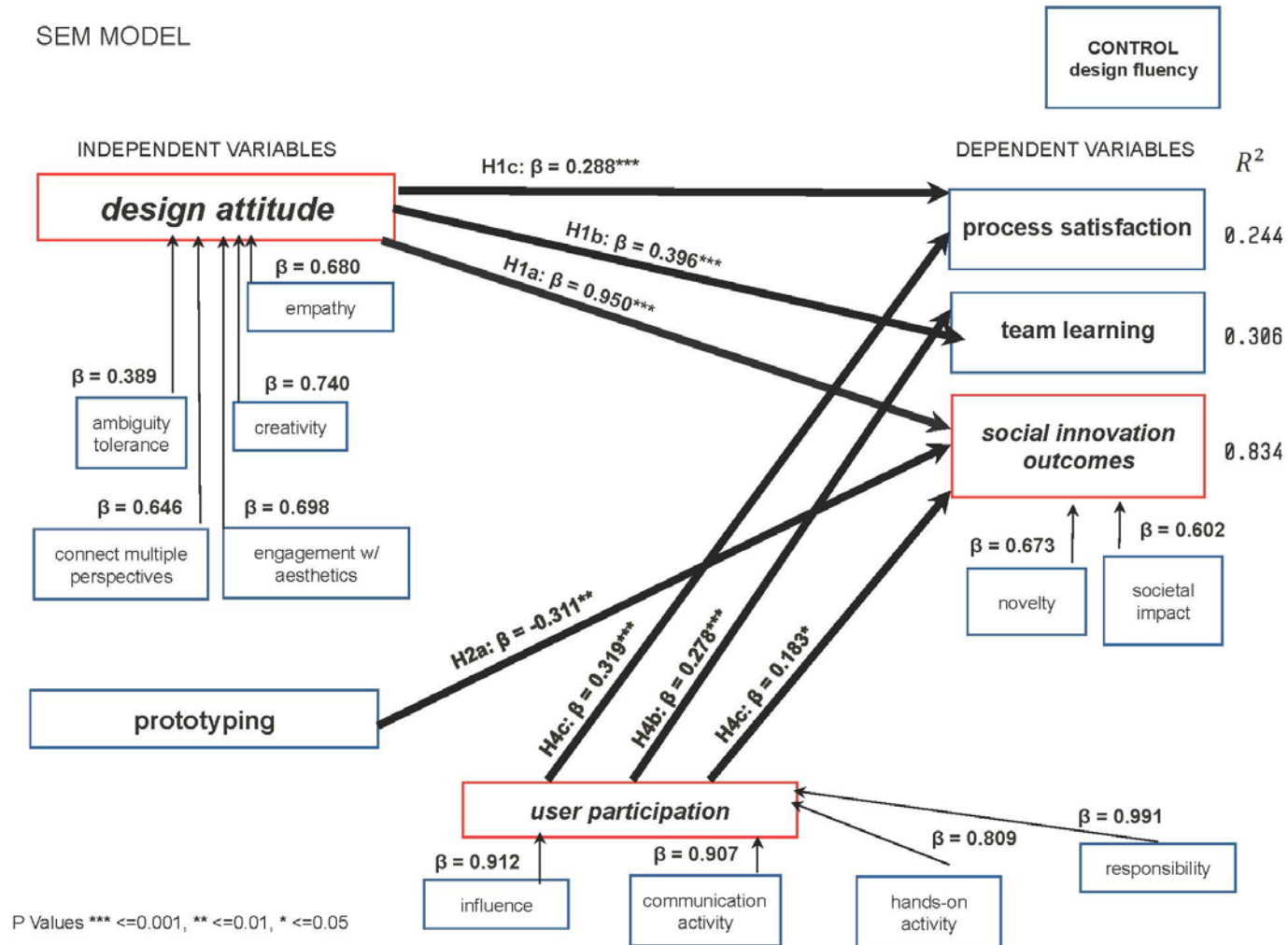
MacKenzie, & Podsakoff, 2012). Thus we performed a common method bias test to determine, if a method bias was affecting the results of our measurement model. The test we used was the “unmeasured latent factor” method recommended by Podsakoff et al. (2003) for studies that do not explicitly measure a common factor such as this study. Comparing the standardized regression weights before and after adding the Common Latent Factor (CLF) shows that none of the regression weights are dramatically affected by the addition of the CLF—the changes are less than 0.200 and the CR and AVE for each construct still meet minimum thresholds. Nevertheless, to err on the conservative side, we have chosen to retain the CLF for our structural model (by imputing composites in AMOS while the CLF is present) and thus we gave common method biased (CMB) adjusted values.

Structural model. As noted, our study seeks to establish the nomological validity of design attitude and its predictive validity on social innovation, team learning, and process satisfaction as well as measuring the impact of prototyping, visualization and user participation on these same dependent variables. To investigate our hypothesized direct effects we next ran a structural model using AMOS (Analysis of Moment Structures) software version 21, a covariance-based structural equation technique using the maximum likelihood estimation approach. Our model is formulated with four independent variables (design attitude, prototyping, visualization, and user participation) and three dependent variables (team learning, process satisfaction and social innovation outcomes) while controlling for design fluency.

We first explore model fit before trimming insignificant paths; we find our model demonstrates excellent model fit ($\chi^2 = 1966.885$, $df = 1339$, $\chi^2/df = 1.469$ $p = .000$, CFI =

.890, RMSEA= .045, SRMR= .0716, and PCLOSE= .977). However, we note some paths are shown to be insignificant and therefore we proceed with trimming the model by deleting one insignificant path at a time, starting with the most insignificant. In our final trimmed model (Figure 11), we eliminate the path between prototyping and team learning as well as eliminating visualization as an independent variable. This insignificance is likely due to visualization loading strongly with aesthetics and creativity as we saw in EFA and CFA analysis, so these relationships are likely captured in the design attitude paths. The final trimmed model also demonstrates excellent model fit: ($\chi^2 = 1746.897$, $df = 1193$, $\chi^2/df = 1.464$ $p = .000$, CFI = .894, RMSEA= .045, SRMR= .0721, and PCLOSE= .975). All other paths were found to be significant and thus will be used to discuss findings in the following section.

Figure 11: Final Structural Equation Model (SEM) Trimmed with Hypotheses and Betas



Findings

Overall our model included 10 hypotheses of which six were supported and four were not. We tested only direct effects in our measurement model and all hypotheses explored direct positive relationships. Hence, an unsupported hypothesis equates to either a path between constructs that was insignificant ($p < 0.05$), or negative ($\beta < 0$). Results reported below are based on the final trimmed model following the analysis in the preceding section.

A salient set of findings in this study is that the model supported each and every design attitude hypothesis. We found evidence of significant positive relationships between design attitude and social innovation project outcomes ($\beta = 0.950, p < 0.001$), between design attitude and team learning ($\beta = 0.396, p < 0.001$), and between design attitude and process satisfaction ($\beta = 0.288, p < 0.001$). *Thus, hypotheses H1a, H1b and H1c are supported.*

Our hypotheses for prototyping and visualization were not supported using our model. For prototyping, we found the path between prototyping and team learning to be insignificant and even negative ($\beta = -0.173, p = 0.257$). *Thus H2b was not supported.* In the case of prototyping and social innovation project outcomes, we discovered that the path was significant given our model, but there was a *significant negative direct effect* ($\beta = -0.311, p = 0.012$). Because we hypothesized a positive direct effect, *H2a is not supported.* In the process of trimming the model, we eliminated the visualization construct entirely, based on insignificant paths. *H3a was not supported* due to the insignificant path between visualization and social innovation project outcomes ($\beta =$

$-0.139, p = 0.188$), likewise *H3b* was not supported due to the insignificant path between visualization and team learning ($\beta = -0.166, p = 0.228$).

We also found evidence of a positive relationship approaching significance between user participation and social innovation project outcomes ($\beta = 0.183, p = 0.070$). We found strongly significant positive relationships between user participation and team learning ($\beta = 0.278, p < 0.001$), and between user participation and process satisfaction ($\beta = 0.319, p < 0.001$). Thus, hypotheses *H4a*, *H4b* and *H4c* are supported.

Figure 12 presents these hypotheses results at a glance.

Figure 12: A Summary of Hypotheses Testing

Hypothesis #	Hypothesis	Standardized Estimate	p-value	Supported/Not Supported
H1a	Design attitude has a direct positive effect on social innovation outcomes	0.950	<0.001 (***)	Yes
H1b	Design attitude has a direct positive effect on team learning	0.396	<0.001 (***)	Yes
H1c	Design attitude has a direct positive effect on process satisfaction	0.288	<0.001 (***)	Yes
H2a	Prototyping has a direct positive effect on social innovation outcomes	-0.311	0.012 (**)	No (negative relationship)
H2b	Prototyping has a direct positive effect on team learning	-0.173	0.257	No (no relationship)
H3a	Visualization has a direct positive effect on social innovation outcomes	-0.139	0.188	No (no relationship)
H3b	Visualization has a direct positive effect on team learning	-0.166	0.228	No (no relationship)
H4a	User participation has a direct positive effect on social innovation outcomes	0.183	0.07 (*)	Yes (weakly)
H4b	User participation has a direct positive effect on team learning	0.278	<0.001 (***)	Yes
H4c	User participation has a direct positive effect on process satisfaction	0.319	<0.001 (***)	Yes

The structural equation model (Figure 11) shows the following R^2 results for our dependent variables: for the model for process satisfaction (independent variables: design attitude and user participation) $R^2 = 0.244$, for the model for team learning (independent variables: design attitude and user participation) $R^2 = 0.306$, for the model for social

innovation (independent variables: design attitude, user participation and prototyping) $R^2 = 0.834$. This means that the variance explained by the model for process satisfaction is 24.4 %; by the model for team learning is 30.6 %, and by the model for social innovation is 83.4 %. We note that 83.4 % is high for a model with so few independent variables and discuss this result as a limitation of this study in the final limitations section of the dissertation.

Discussion and Theoretical Implications and Extensions

Design Attitude and its Effects

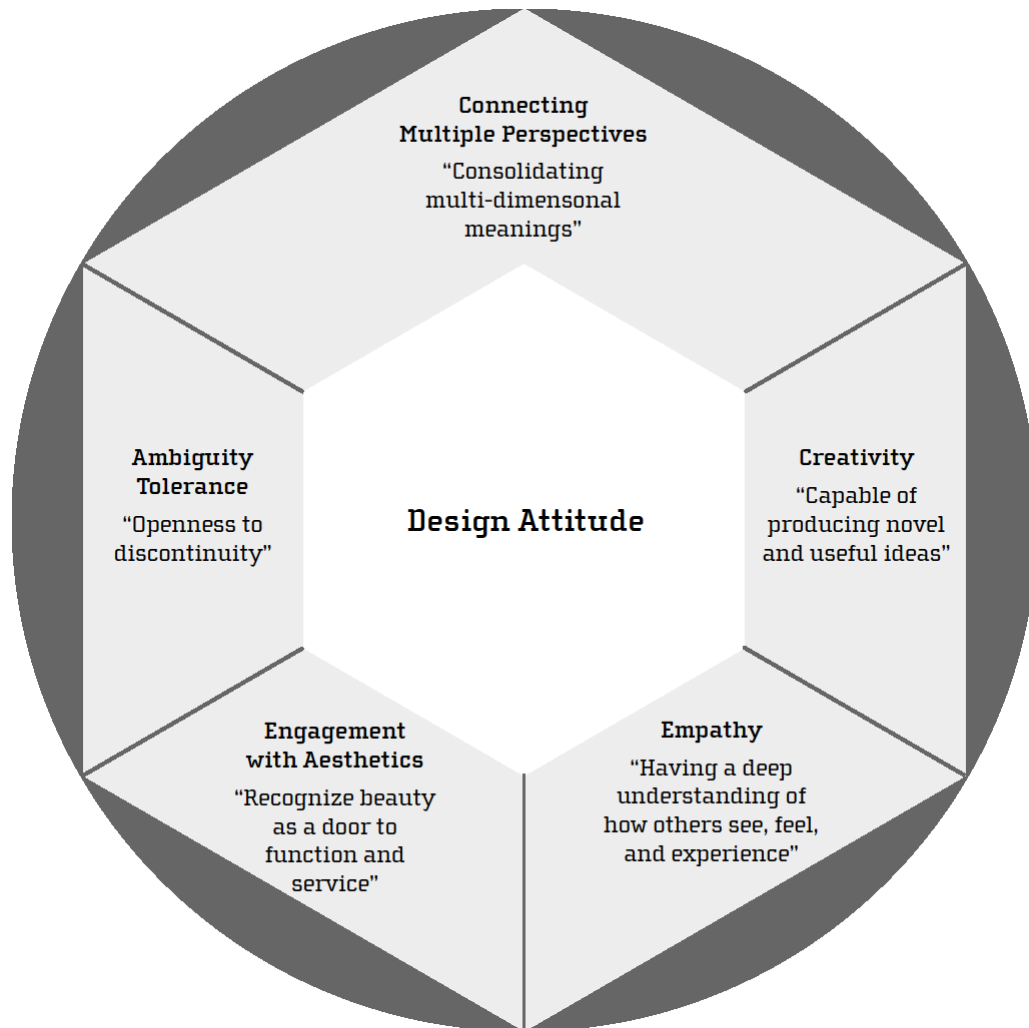
The two most significant contributions of our study to design for social innovation and management theory and research may be: firstly, putting forth new psychometric scales that are consistent with prior theoretical and empirical research, and operationalizing design attitude as an aggregate or formative second-order multidimensional construct (Law et al., 1998), and secondly, establishing the content, nomological and predictive validity of design attitude and thereby providing novel insights into design behaviors that influence social innovation processes in what remains an emergent field for design—where the value designers bring is yet to be fully understood. For the first time, we measure relationships between design attitude and complementary constructs in the design domain (prototyping, visualization and user participation) within a rigorously designed quantitative framework that tests the connections between these factors and processes of satisfaction, team learning and social innovation project outcomes for the population of interest of our instrument—a predominantly design and design-fluent audience. By establishing the predictive validity of design attitude in the emergent field of design for social innovation, the findings in this

study are the first of their kind, to the best of our knowledge. They demonstrate the significant value teams that espouse a design attitude (and embrace its characteristic and five multi-faceted dimensions of creativity, connecting multiple perspectives, empathy, ambiguity tolerance, and engaging in aesthetics) have in the context of social innovation projects, team learning and process satisfaction, presenting a set of foundational metrics that ultimately explain with new evidence how and why design matters in this domain.

Importantly, while our study successfully operationalizes the five theoretical dimensions of design attitude in prior research, it also introduces a sixth dimension of design attitude—systems thinking—for completeness of the design attitude construct. We considered “systems thinking” a valid dimension for analysis on grounds of the considerable theoretical and empirical weight of the systems thinking dimension in organizational learning and social innovation literatures (Jackson, 2003; Kellert, 2009; Mulgan, 2014), and examined its possible implications in completing the construct’s validity. We chose to explore the holistic attributes in the “connecting multiple perspectives” theoretical category proposed by Michlewski. We also reviewed Buchanan’s conceptualization, which extended this category as “the ability to see the whole situation” (Buchanan, 2009, see Appendix A for his unpublished Design Attitude metric). We probed whether we could detect in design attitude the systems thinking dimension as one that showcases individuals’ capabilities to have awareness of their decision-making and actions as interdependent, and part of a larger system that fluctuates over time and space. Ultimately, our operationalization of the systems thinking dimension in this study did not yield differentiable results (we suspect this may be in part accounted by similar responses to systems thinking components in our survey, as well as

by some confounding behavior with the connecting multiple perspectives dimension of design attitude where the systems thinking dimension may be already captured). We were not able to demonstrate discriminant validity for the systems thinking dimension, and thus conclude it may not be warranted in the conceptualization of the design attitude construct. One possible reason for these results in our study may be that the systems thinking concept, although one gaining more traction in design for social innovation practices, may remain elusive to designers who in many instances are bound by project contractual agreements. Often, expectations for designers' punctual contributions may curtail their participation and influence from a macro-level playing field where they could be privy to the interconnected and interrelated issues that are part of the project's ecosystem (Findeli, 2001). Figure 13 illustrates the final first order dimensions of design attitude that we operationalized in this study and found to be relevant after measurement.

Figure 13: Design Attitude Dimensions Validated in the Study



By eliminating systems thinking, we arrived at a parsimonious measurement model that clearly establishes the direct positive significant relationships between design attitude and each dependent variable. Our three design attitude hypotheses were supported verifying the strong theoretical justification for design attitude and further validating our instrument. Researchers could use the scales we adapted and developed with high confidence to measure future design attitude relationships in design contexts of varying nature, expanding the inquiry outside the social innovation framework. Finally,

because design attitude is an aggregate, second order multidimensional construct in our study, further analysis of its individual dimensions could prove of value. Although outside the scope of this research, we note that analyses identified that empathy, connecting multiple perspectives, and ambiguity tolerance are particularly strong dimensions of the design attitude construct. These are first order relationships that would warrant deeper exploration in the future.

It is worth underlying that the instrument was clearly more effective in soliciting responses for design attitude than for questions aimed at probing social innovation project outcomes, where our sample was notably smaller (design attitude $n=370$ vs. complete survey $n=233$). These results do not come as a surprise, and in many ways were already signaled during the instrument's Bolton protocol testing; we theorize that the drop of responses for this section of our survey may be explained by the fact that designers' usual unit of design work is the project and it is often hard for them to demonstrate impact, because they will be likely removed from the phase of implementation and evaluation that constitutes the outcomes phase (Mulgan, 2014).

Supporting Constructs in the Study and Their Effects

User Participation

As the theoretical and empirical literature indicates, our study confirmed the positive significant relationship of user participation with our three dependent variables. As we previously noted, the role of co-creation in the design for social innovation context is well established from a theoretical and empirical perspective (Ehn, 2008; Sanders & Stappers, 2008). By adapting the information systems scale of Hartwick and Barki (Barki

& Hartwick, 1994; Hartwick & Barki, 2001) this study operationalizes the significance of user participation as a whole for design. One novel result of our research is the application of this multidimensional conceptualization of user participation, and its four distinct dimensions (communication, hands on activity, responsibility, and influence) to measure its impact on social innovation project outcomes, team learning and process satisfaction. Our study verifies and extends Hartwick and Barki's specification of these four dimensions (despite less differentiation of these at the EFA level which could present an opportunity for further research), and demonstrates the significant direct effects of user participation that we would expect to see in the design for social innovation context.

Visualization

One interesting result of our study is that in the presence of design attitude, visualization as a construct becomes insignificant. We theorize that this happens because visualization confounds with dimensions of design attitude such as creativity and aesthetics in the instrument we developed. We noted during EFA analysis that these two dimensions of design attitude loaded strongly with visualization, so this may be a likely source for these results. We know from empirical studies that visualization in social innovation projects plays a large role in advancing positive outcomes, with visualization often having a beneficial impact in bureaucratic cultures dominated by prose (Mulgan, 2014); therefore we do not consider these findings in our study to necessarily dispute previous research in this area.

Prototyping

Another finding of note is that this study shows that prototyping has a negative direct effect on social innovation outcomes in the presence of design attitude and user participation. This indicates prototyping actually hurts social innovation outcomes when accounting for the presence of design attitude and user participation. This is a rather counter-intuitive and surprising finding given the emphasis of prototyping as a widely championed method in design to advance conceptual development and problem solving. In the context of this study, we theorize that prototyping is related to dimensions of design attitude and user participation (e.g. specifically, with the dimension of hands on activity in user participation, and that of ambiguity tolerance in design attitude). Another possibility for interpretation about this negative result is that because the process of prototyping gives form to a given anticipated solution in a process of innovation, it may actually halt exploration and cut short alternative possibilities, explaining its negative relationship in our model. Thus, we believe it would be interesting to test the role of prototyping in a more general or expanded setting to determine if prototyping should truly be considered a negatively influential construct when user participation and design attitude are present. Furthermore, because prototyping showed an insignificant relationship with team learning in our model, we also suspect that we are in the presence of confounding relationships.

Implications for Practice

The findings of this study have clear practical implications for the emergent field of design for social innovation as a whole, at a critical time when some of the leading practitioners of design and social innovation and of the public sector are signaling that

concurrent with the promise of design developing into one of the defining fields of the next decades, is the risk of design not raising to its full potential and becoming “a fad that failed” (Boyer et al., 2011; Mulgan, 2014) precisely because of a lack of systematic evaluation of its impact. Thus, there is a clear imperative to demonstrate design’s lasting value in provoking beneficial processes of social change. In this sense the robust quantitative framework examines recurrent cognitive abilities and skills that comprise design attitude and shows that design attitude accounts for significant positive effects in social innovation project outcomes, as well as in team learning and process satisfaction, providing strong evidence of the value and “return on design” in social innovation.

Limitations

Generalizability is always a concern in contextually dependent samples. While we attempted to capture a relative wide spectrum of diversity within our population of interest, data availability from our survey was limited to sampling design practitioners, educators, students, and project managers who all exhibited a rather high degree of design expertise and design attitude fluency. Additionally, these are individuals who had competency with the typology of social innovation projects that we were interested in probing. Hence, our results may help understand the designer or project manager who falls within this demographic, but it is not clear that our findings would be generalizable outside this range of individuals in the same way. Furthermore, the scales used in this study, many of which are new, have never been used in this combination, and there are no good tests for validity. Overall, some caution should be acknowledged with regards to measures. Because such a core emphasis of this study was to operationalize the multi-dimensional construct of design attitude, i.e. creating an instrument to test a number of

relationships between design attitude and social innovation project outcomes, team learning, and process satisfaction, an important path for future research might be to seek to validate our instrument in other professional contexts. Investigating for example the design attitude scale outside the social innovation context, or alternatively with a majority of non-designers would be plausible directions for future research. Finally, exploring the first order dimensions of design attitude and user participation and their relationships with social innovation project outcomes, team learning, and process satisfaction would further inform our understanding of the role of design behaviors and approaches in the social innovation context overall.

Concluding Perspectives

Henry Mintzberg (2005) reminds us that research and theory development are insightful when they surprise, when they allows us to see profoundly, imaginatively, and unconventionally into phenomena we thought we understood. As a relatively emergent phenomenon, design for social innovation is hardly understood. Throughout this study, we have strived to take our lead from empirical behavior and practice, and wrestled with the push and pull, as well as with the contradictions of translating ideas from the qualitative to the quantitative (Bergson, 1971). We have sought to arrive at new quantitative measures that may allow us to articulate with renewed precision how design attitude accounts for team learning, process satisfaction and social innovation project outcomes. And most of all, we have remained intent to not lose sight of the important and multifaceted concerns inherent to design's promise as a human capability for questioning, adapting and innovating--however "uncertain, unsettled and disturbed" (Dewey, 1938) the present global context may be.

Prelude to Chapter 3

“The application of thought, science, or philosophy in action is dialectical: it involves the development of man relative to himself and to other selves and in the context of society and the world.”

— Richard McKeon, *“Dialectic and Political Thought and Action,”* in *Ethics*, 1954.

My interpretations of how design attitude manifests in the organizational context of UNICEF and its Innovation Unit as a whole are the outcome of my stepping into the cultural environment and institutional setting of an organization whose mandate and make-up of people I have long been fascinated with. As it happens when one embraces the ethnographic method, the task of understanding sapped a tremendous amount of emotional energy, and created a sense of profound disorientation at times, as I negotiated my personal response to the experience of fieldwork with taking the necessary distance to categorize the phenomena under investigation. This chapter does not attempt to minimize that tension, but does strive to portray with honesty and clarity the particular phenomena and processes that I observed first hand.

CHAPTER 3: INNOVATION BY DESIGN AT UNICEF: AN ETHNOGRAPHIC CASE STUDY¹³

Introduction

Innovation for international development identifies and supports new ways of “doing different things,” “doing things differently that add value” (UNICEF, 2014a; WorldBank, 2014), and advocates for thinking outside the box and taking risks to reach equity (UNDP, 2014). The field is rapidly growing, along with the fast-evolving recognition that governments and multilateral organizations acting alone cannot meet the rising demands of poor and under-served populations worldwide. Confronted by profound political, economic, social and technological transformations and an exponential increase in humanitarian crises, the organizations that lead international development efforts are operating in an entirely new global context for decision-making that is altering long-standing assumptions and institutional logics (The World Economic Forum, 2015). A sense that “the innovation fever has broken out” amidst a shifting landscape of international development (Murray, 2014) is manifesting in new job titles and divisions that include the “innovation” epithet throughout international nongovernmental offices (INGOs). In an organizational context defined by a humanitarian mandate of great urgency and circumstances with high stakes, innovation approaches to development are translating into new policies as well as concrete initiatives that increasingly focus on program results and effective solutions and often apply new information and communication technologies (ICTs).¹⁴ The term “innovation” is used in

¹³ Qualitative Research Report, February 2015

¹⁴ While far from being exclusively about high technology artifacts, many innovation initiatives in development adopt emerging technologies as “game changing” solutions that enhance services, track data

this context as a means of adaptation and improvement through finding and scaling solutions to problems, in the form of products, processes or wider business models (Betts & Bloom, 2014). These innovation initiatives promote new modes of experimentation, open source collaboration, transparency, and long-term sustainability, and are requiring new problem solving and adaptability. This is precisely one of the junctures where an emergent breed of design-based practices that are oriented towards collective and social ends, in which designers increasingly act as mediators and knowledge brokers between different fields of expertise, seem to be gaining recognition and traction (Armstrong et al., 2014).

At UNICEF, the United Nations Children’s Fund, design and designers are being integrated in an innovation agenda that has been embraced with substantive organizational commitment. For the first time in the organization’s history, the 2014–2017 strategic plan includes “the identification and promotion of innovation” as one of the implementation pillars to advocate for and safeguard the welfare of the world’s 2.2 billion children (UNICEF, 2014c).¹⁵ The Innovation unit at UNICEF, the principal arm of UNICEF Innovation, is tasked to carry out the UNICEF innovation mandate and confront the complexity, fragility, and uncertainty that characterize a new era of global cooperation where assumptions about aid and development are being profoundly redefined (Banerjee, Banerjee, & Duflo, 2011; Collier, 2007; Easterly, 2006; Easterly &

in real time, and evaluate impact—all of it in a wide range of matters, including citizen participation, health, education, identity, security and beyond OECD. 2012. Innovation for development: OECD, UNICEF Innovation. 2014. UNICEF Innovation Annual Report 2014.

¹⁵ UNICEF’s strategic plan calls for innovation to “adopt, adapt and scale up the most promising approaches to realize the rights of every child” across seven outcome areas of the organization’s programs (health; HIV&AIDS; water, sanitation & hygiene; nutrition; education; child protection and social inclusion) UNICEF. 2014d. UNICEF Strategic Plan 2014-2017 brochure.

Williamson, 2011). As a relatively young and entrepreneurial division within the organization—only established in 2007 and reporting to UNICEF’s Executive Director office since December 2013—the Innovation Unit is comprised of an interdisciplinary core team of approximately twenty individuals at UNICEF headquarters in New York and in San Francisco, who in turn collaborate with a larger innovation team of more than one hundred who are distributed globally.¹⁶ Their innovation practices leverage technology, partnerships with the private sector and academia, and—importantly, given our research focus—integrate design to make an impact while operating in some of the world’s most difficult environments (UNICEF Innovation, 2014).

This inquiry centers on an ethnographic case study that probes how design capabilities and design principles are articulated as part of the innovation agenda of UNICEF and manifest within the organization, and throughout the experiences of its main actors. The original research purpose was to further understand how “design attitude” approaches, a set of abilities that impact innovation and organizational learning (Boland & Collopy, 2004; Boland et al., 2008; Buchanan, 2008; Michlewski, 2008) could be discerned within the innovation agenda of UNICEF by focusing on the processes and practices that characterize the projects and programs of the Innovation Unit.

Two broad and interrelated research questions guide this inquiry. First, how does design attitude and its dimensions manifest within projects undertaken by the unit and the organization at large? Secondly, how can we relate the manifestation of salient design attitude dimensions and practices to the processes of innovation underway at the

¹⁶ I am greatly indebted to Erica Kochi and Christopher Fabian, the Innovation Unit’s Co-Leads as well as their team for their openness to my pursuing this empirical study. The introductions and access to informants and information that they facilitated at UNICEF represented a measure of extremely important support throughout this ethnography.

organizational level? By answering these questions, the aim is to develop actionable theory that reveals the relationships of design to collective human agency and innovation at the organizational level. At a time when the increasingly complex demands on today's organizations suggest that management practices must combine art, craft and science (Mintzberg, 2004), I believe that the intrinsic role designers play in cultivating innovation in organizations that are oriented toward achieving social innovation outcomes and enhancing "society's capacity to act" (Grice et al., 2012) merits continued interpretation and elucidation (Amatullo, 2013; Buchanan, 1998). There is a venerable tradition in design and organizational theory (Buchanan, 1992, 1998, 2009; Rittel, 1987; Schön, 1983; Simon, 1969) and a healthy dose of empirical studies that straddle the design and management literatures (Boland et al., 2008; Cooper et al., 2013; Kimbell, 2009) championing design thinking and design practices as effective strategies for invention and problem-solving in private and public sector organizations (Brown, 2009; Jégou & Manzini, 2008; Mulgan, 2014; Staszowski & Manzini, 2013). However, amidst a seeming acceleration of "wicked" problems (Buchanan, 1992; Rittel & Webber, 1973) that characterize the state of the world today, and despite the increasing interest to apply design thinking principles and methodologies to consciously rethink institutions and amplify their capacity to innovate (Boyer et al., 2011, 2013; Buchanan, 1992), the call for a better understanding of design in this equation remains strong. Studies that focus on empirically based evidence to investigate "the return on design" in the social realm, and research that traces the cognitive capabilities and cultural values accounting for the success and impact of such socially based design practices remain few and far between. By offering an empirically grounded look at how a set of design practices and shared

design values are enacted and embedded within the innovation agenda of UNICEF, this field study aims to contribute to filling this gap.

The research design of this study includes qualitative data collected from twenty-one semi-structured interviews, including Innovation unit members as well as key leadership from UNICEF at large; observation notes from the field, extant archival texts, and insights from my shadowing key members of the Innovation team weekly through global phone calls and correspondence over a period of four months (from June until September 2014) as the team prepared for a new “flagship” product deployment at the 2014 United Nations General Assembly, an open-source information platform for building scalable applications for international development called “RapidPro.” I also integrate insights from the two prior empirical studies in this dissertation (chapter 1 and chapter 2). Specifically, I incorporate salient findings from the field survey presented in chapter 2, which offers an aggregate view of the positive significant relationships between the multi-dimensional construct of design attitude and social innovation project outcomes, team learning, and process satisfaction, as reported by managers and designers with a level of high design fluency practicing predominantly in the social and public sectors.

The phenomenological ethnographic stance that I adopt aligns with the family of “impressionistic tales” that the ethnographer John Van Maanen has identified (Van Maanen, 2011): a search for meaningful insights where the researcher balances a focused and exact account of fieldwork with a measure of deeply individual vibrancy and reflexivity in the interpretation and theorizing that characterize the analyses. It was important to strike this balance, however precarious, because the back-and-forth allowed

me to capture uniquely rich insights generated *in vivo*, close to the point of origin, and then layer my intuitive lens and relevant theoretical perspectives onto the analysis (Barley, 1990; Van Maanen, 1979b). In particular, I extend a deeply humanistic concept of design informed by John Dewey and Richard McKeon who have laid a critical philosophical groundwork for design thinking and design inquiry (Buchanan, 2009) that informs my understanding of how designers go about leading innovation in organizations. As sense making of the data matured and theoretical categories emerged from the recursive, process-oriented analyses pursued, I built on contemporary theories from the domains of design, organizational culture and institutional logics. Since I was concerned with interpreting how the shared values, belief systems, assumptions and practices encompassed by design attitude manifested and impacted innovation at UNICEF's organizational level, I explored literature streams that connect key concepts of design and organizational culture from the inception of the research journey. My addition of institutional logics as a focal point of the literature review for this study came much later in the development of the manuscript, as an iterative process of inductive theory-building analysis uncovered new theoretical patterns in the data (Nag, Corley, & Gioia, 2007). This led me to pursue the institutional logics perspective as a valid framework to understand how the practices and identities of the institutional actors I had been observing both within and outside the Innovation Unit were related to the larger empirical setting of UNICEF as well as to macro-level questions of legitimacy and action in the organization.

The findings of this study may be considered significant in several respects. First, by offering an in-depth view of the innovation activities underway at UNICEF, this

inquiry provides a newly nuanced and whole portrait of innovation and entrepreneurial processes that surface the tensions and struggles that characterize a systematic mandate of design-driven change across a pluralism of competing institutional logics. Secondly, this examination of design attitude manifestations identifies a set of “wins” for design’s collective agency along with important inhibitors or barriers that materialize against a backdrop of two critical themes that design must contend with at this global scale of intervention: 1) accountability, and 2) urgency. The weight of these themes in this particular study elucidates anew the emergent and un-codified nature of generative modes of design approaches in organizations in flux, pointing to new implications for design as it moves forward in contributing to social practices at a global scale of impact. Finally, a salient contribution of this study is that it paints a portrait of design and innovation processes at the macro-organizational level informed by empirical evidence—allowing for cross-level analysis and multi-contextual insights that highlight the links between the actions of individuals and macro-level outcomes—a topic of continued relevance for organizational practice (Thornton & Ocasio, 2008).

The study is organized as follows. First, I introduce the theoretical lenses that form the backbone of this ethnography and serve as orienting points to anchor my research questions. Next, I present the methods of my interpretative field study of the Innovation unit at UNICEF and the dialectical strategy of inquiry that I follow, whereas dialectic is used separated from ideology and instead as a creative art for questioning, interpretation and exploration (Buchanan, 1998; McKeon, 1954) of how design attitude manifests within the activities of the Innovation Unit. I proceed by discussing findings and conclude with implications for practice and future research.

Theoretical Background

Design as Inquiry and Design Attitude

A Broad Definition of Design

The point of departure for my understanding of design in this empirical study of innovation at UNICEF follows Richard Buchanan's characterization of design as a knowledge domain defined in its broadest sense as a concrete and deeply humanistic activity that 1) encompasses a pluralism of subject matters; 2) takes on a variety of forms (from communication artifacts, to products, services, systems and environments); and 3) deploys a wide range of methods (Buchanan, 2009). Buchanan identifies four orders of design distinguished by their design object (symbols, things, action and thought) as "places in the sense of topics for discovery." My interpretations of how design attitude manifests and shifts functions within the organizational context of UNICEF are informed by this classification (Buchanan, 2001c). By exposing a practice of designing as a mode of inquiry rather than as a distinct professional or technical competency that is the purview of the "omnipotent designer," I align this research with contemporary streams of design discourse that point to design practices that exist in increasingly complex organizational settings and interdisciplinary and collaborative contexts of use (Binder et al., 2011; Jégou & Manzini, 2008; Staszowski & Manzini, 2013). In these situations, there is a recognition of the integrative and generative quality of design and an increasing validation of design's capacity to act as a mediating discipline that is fundamentally about facilitating creative processes that contribute new meaning and break with traditional thinking in decision-making through deliberation, stewardship and action (Boyer et al., 2013; Buchanan, 1998; Kimbell, 2009). The notion of stewardship as it

relates to design aimed at societal change is of particular importance in this study since it situates design as a means to address a class of challenges that are complex and systemic in nature—which is the case of the problems the UNICEF Innovation Unit takes on. In this sense, the pragmatism of John Dewey and his characterization of inquiry “as the controlled or directed transformation of an indeterminate situation into one that is determinate in its constituent distinctions and relations as to convert the elements of the original situation into a unified whole” (Dewey, 1938, reprint, 2008) is worth pointing to as a foundational tenet for this research since my observations relate to actionable design practices that are as much about problem seeking as problem solving (Buchanan, 2009).

Design Attitude

The treatment of the multi-dimensional concept of design attitude, which I view *as a set of abilities that impact innovation and organizational learning* (Boland & Collopy, 2004; Boland et al., 2008; Buchanan, 2008; Michlewski, 2008) is at the core of this empirical study. This construct has been posited as a valuable factor that influences positively generative inquiry and action in management (Boland & Collopy, 2004; Boland et al., 2008). Boland and Collopy defined design attitude as “expectations and orientations one brings to a design project” (2004: 9), highlighting designer’s capabilities as a distinct set of heuristics that deviate from more linear aptitudes for decision-making of managers. Their insights about designers’ fluid and open orientation to experimentation are relevant to this inquiry about an innovation and design team that operates in situations that often break with normative and bureaucratic practices of UNICEF at large. Their emphasis also characterizes design attitude as an unfolding process in organizational practice that is fundamentally humanistic and aspirational--the

resolve “to leave the world a better place than we found it” (Boland & Collopy, 2004: 9); it is a call to action about the potential role of design and designers in shaping and bringing value to organizations (Boland & Collopy, 2004). Importantly, the concept of design attitude implies a propositional and reflective stance about design (Schön, 1983; Simon, 1969) that is important in highly volatile circumstances, which characterize much of the context of operations for UNICEF. Kamil Michlewski’s (2007, 2008) research expanded on Boland and Collopy when he identified five key dimensions of design attitude based on an a multi-case interpretative field study that explored the culture of designers in innovation and design consultancies.¹⁷ His conceptualization has been significant in that he captured shared values and meanings of design thinking in organizations in a holistic manner that goes beyond treating design thinking as simply a more narrow set of procedural skill sets or cognitive-based methods for analysis (Buchanan in Michlewski, 2015); this is a direction I follow in this study. My own quantitative research in chapter 2 has sought to further operationalize Michlewski’s five first-order dimensions of design attitude (the study tested the constructs as “ambiguity tolerance,” “creativity,” “aesthetics,” “empathy,” and “connecting multiple perspectives”) in order to establish the content, nomological and predictive validity of design attitude and put forth new psychometric scales to measure design attitude as a formative, second order construct (Jarvis et al., 2003) with regards to social innovation project outcomes, process satisfaction and team learning. The present empirical study extends this research in two important ways: 1) it probes the manifestations of design attitude in an

¹⁷ Michlewski’s five dimensions of design attitude are: 1) consolidating multidimensional meanings; 2) creating, bringing to life; 3) embracing discontinuity and open-endedness; 4) embracing personal and commercial empathy; and 5) engaging poly-sensorial aesthetics.

organizational context and ties the investigation of design attitude with top-down effects of institutional logics as opposed to an examination of its manifestation at the project level which is the empirical focus in Michlewski's work (Michlewski, 2008), and 2) it examines in-depth three of the five dimensions of design attitude—"connecting multiple perspectives," "empathy" and "ambiguity tolerance"—that showed strong statistical significance in my prior study, and that I was particularly keen to probe in the organizational context of UNICEF (these particular first-order dimensions are integrated in the study's interview protocol, Appendix C).¹⁸ It also uncovers the polarizing effects of the other two dimensions of design attitude—creativity and aesthetics—in this organizational context.

Organizational Culture and Emergent Practices

A Contested Concept: Organizational Culture

Because of my interest in arriving at a better understanding of the manifestations of design attitude in the organizational context of UNICEF, not only its alignment with innovation practices, but also how design attitude approaches unfold and are perceived in the larger empirical setting of the organization, I relied on perspectives from the interdisciplinary field of cultural studies to inform my investigation. The often-contested concept of "culture" in organizations can be of particular value in studies that derive from observations of real behavior and seek to make sense of organizational data, which is the case of this empirical research (Schein, 1996). Given that this inquiry is about an understanding of design within the complex organizational context of UNICEF, I probe

¹⁸ I purposely did not directly probe the other dimensions of design attitude (creativity and aesthetics) in the interview protocol of this study, assuming they would manifest in a more tacit manner given the organizational context of UNICEF; this was indeed the case. A more extended examination of these two dimensions would be warranted in a future study.

aspects of organizational cultural dynamics treated as a root metaphor indicative of a pluralism of particular forms of human beliefs and expression (Smircich, 1983) and everyday behavior in organizational life (Martin, 2002a). By expanding upon Edgar Schein's functional definition of organizational culture as a *learned product of a group experience based on a group's set of values, norms and assumptions* (Schein, 1985), I subscribe to the notion that *cultural manifestations of a group's set of values, norms and assumptions include formal and informal practices, organizational stories and rituals, jargon and language, humor, and physical arrangements* (Martin, 2005). These manifestations may not necessarily be always uniformly *shared* (Frost et al., 1985; Sergiovanni & Corbally, 1986) or *unique/distinctive* to the group of study (Smircich & Calás, 1987). I treat the Innovation Unit at UNICEF as a culture-producing phenomenon or milieu (Singh & Dickson, 2002) that is a locus for design attitude and examine cultural manifestations that show evidence of design attitude capabilities as "*patterns of meanings that link these manifestations together, sometimes in harmony, sometimes in bitter conflict between groups and sometimes in webs of ambiguity, paradox, and contradictions*" (Martin, 2002a: 3). Adopting the rationale that any in-depth look at an organization is bound to reveal a pluralism of perspectives, I follow the three-perspective framework (the integration, differentiation and fragmentation views) for conceptualizing organizational culture proposed by organizational scholar Joanne Martin (Martin, 2002b). Moreover, I embrace the idea of culture as a means to focus our attention on the subjective, interpretative aspects of organizational life (Smircich, 1983). In this regard, the symbolic perspective of culture that informs the work of anthropologist Clifford Geertz (1973) and more recent cultural anthropology studies (Clifford & Marcus, 1986;

Fortun, 2012) where culture can be understood as something continually under social construction in time and space, form important guideposts to my analyses, along with the organizational ethnography work of John Van Maanen and his reflexive examination of power relations in workspace contexts (Van Maanen, 1979a, 2011; Van Maanen & Barley, 1982); these perspectives are insightful vis-à-vis the actions of the individuals in the Innovation Unit who espouse a design attitude that at times clashes with dominant norms in the organization.

Emergent Practices

The emphasis the Welsh cultural critic Raymond Williams places on the dynamic interrelations that characterize cultural processes adds important insights to this investigation as I seek patterns of meaning within the cultural environment and practices of the Innovation Unit. Williams' concept of *emergence* within an organizational environment, a concept that refers to *the process of coming into being or prominence* is posited as a locus "where new meanings, values, practices and new relationships and kinds of relationships are continually being created" (Williams, 1977). For Williams, the emergent does not necessarily equate with the merely novel, and can only be fully defined and understood vis-à-vis the dominant: it presupposes a substantial alternative or oppositional force to what we might see as the dominant state of affairs characterizing trends and activities fully accepted and mainstream. This perspective helps ground my interpretations of the many seemingly "emergent" innovation practices and design attitude approaches that manifest throughout this study where change initiatives diverge sometimes from the vested interests and norms of the dominant organizational culture of UNICEF.

The Institutional Frame

Given the nature of the increasingly multifaceted global forces that characterize international development today, upon entering the research setting of UNICEF, it was clear that I would have the opportunity to study up-close an organization undergoing complex processes of institutional change in which design attitude manifestations would represent all but one set of phenomena. As I progressed with the analysis of data and thematic categories emerged, it became apparent that the study would benefit from key theoretical lenses from the vast institutional theory literature, specifically from streams of research in organizational theory, sociology and cultural studies that seek to explain the active role of agents in institutional change. While a comprehensive review is outside the boundaries of this study, this section presents a few theoretical streams and definitional issues that guided my inquiry.

Institutional Logics and Embedded Agency

The institutional logics perspective as a meta-theory and method of analysis that provides a framework to make sense of the interrelationships among institutions, individuals, and organizations in social systems is pertinent to this study as I examine the role design attitude and its manifestations exert at the organizational level (Thornton & Ocasio, 2008; Thornton et al., 2012). Institutional logics can be defined as *taken-for-granted social prescriptions that represent shared understandings of what constitutes legitimate goals and how they may be pursued* (Battilana & Dorado, 2010). In this sense, institutional logics guide actors' behavior in organizational fields of activity (Battilana & Dorado, 2010; DiMaggio & Powell, 1991; Ocasio, 1997; Suddaby & Greenwood, 2005; Thornton & Ocasio, 2008). The concept is further defined as *the socially constructed*,

historical patterns of material practices, assumptions, values, beliefs and rules by which individuals produce and reproduce their material substance, organize time and space, and provide meaning to their experiences and social reality (Thornton & Ocasio, 1999).

This expanded definition links the notions of individual agency and cognition of institutional actors with socially constructed institutional practices and rule structures and integrates the structural, normative and symbolic forces of institutions as complementary dimensions (Thornton & Ocasio, 2008). In this regard, the multi-dimensional character of this institutional logics definition aligns well with the treatment of organizational culture as a root metaphor for understanding organizational life that is presented in this study. In particular, it helps highlight how the cultural dimensions of institutions—and in the case of my focus, behaviors associated with design attitude—might represent a specific frame of reference that conditions actors' choices for sense making and may enable and/or constrain social action. Here, two additional concepts from this literature are relevant to this study. First, the notion of *institutional entrepreneurship*, which explains how actors can contribute to changing institutions despite pressures towards stasis (DiMaggio, 1988; Eisenstadt, 1980) and accounts for endogenous forces of change in organizations (Battilana, Leca, & Boxenbaum, 2009). Second, the notion of *the paradox of embedded agency*: which alludes to the tensions or contradictions between individual agency and institutional structure/determinism (Seo & Creed, 2002) and addresses a key puzzle in institutional theory: how can individual actors change institutions if their actions, intentions, and rationality are all conditioned to a certain degree by the very institution that they wish to change (Holm, 1995; Thornton & Ocasio, 2008)? As a means to address the paradox of embedded agency in the context of UNICEF, I expand on empirical

research and theory on social cognition and structuration. Notably influential here is the theory of structuration of the British sociologist Anthony Giddens (Giddens, 1979) which has been adapted by Patricia Thornton, William Ocasio and Michael Lounsbury in their institutional logics work with the concept of “dynamic constructivism” which posits that individuals learn multiple contrasting and contradictory institutional logics through social interaction and socialization. The multiple institutional logics comprise the cultural knowledge available to social actors in society, institutional fields and society (Thornton et al., 2012). These concepts inform how I consider manifestations of design attitude that are embedded in the collective actions of the Innovation Unit and are aimed to mobilize change projects, provoking key tensions at times with the institutional logics of UNICEF at large, and others instead advancing change at the organizational level. In this regard, the institutional logics lens also opens up the opportunity to cull insights at a broad meta-theory level regarding how an organizational setting such as UNICEF, through its underlying logics of action, shapes heterogeneity, stability and change in individuals and throughout its organizational structure (Thornton & Ocasio, 2008).

Methods

Research Design

The purpose of this study is to generate actionable theory that reveals the relationships of design practices and design attitude capabilities to collective human agency and innovation at the organizational level. I seek to understand the process behind efforts of embedding such an approach, and what its effects are on the UNICEF operations at large. I interpret a qualitative field study to consider the meanings and manifestation of design in the complex organizational cultural setting of UNICEF where

circumstances of high stakes characterize the organization's innovation agenda. My ethnographic approach guides a phenomenological and predominantly inductive research strategy, which covers the selection of the field research setting and the processes of data collection, reporting and analysis that I followed. I describe these steps in further detail in this section and summarize them in Table 2.

Research Setting

The situated context of the Innovation unit at UNICEF in the organization's headquarters in New York represented an ideal site to pursue an interpretative ethnographic approach to study how design attitude capabilities and design practices manifest and relate to the innovation mandate in a holistic way within the organization (Singh & Dickson, 2002). First of all, and predating this study, I had established a deeply collegial relationship with the two co-founders and co-leads of the Innovation Unit through my practice as a design educator at Art Center College of Design.¹⁹ This ongoing collaboration dates back to 2007 and the inception of the unit as a budding initiative reporting to the then Director of UNICEF's Division of Communication and now Principal Advisor and Director of the UNICEF Innovation Center in Nairobi, Dr. Sharad Sapra. The fact that I had already this relationship of mutual trust in the organization,

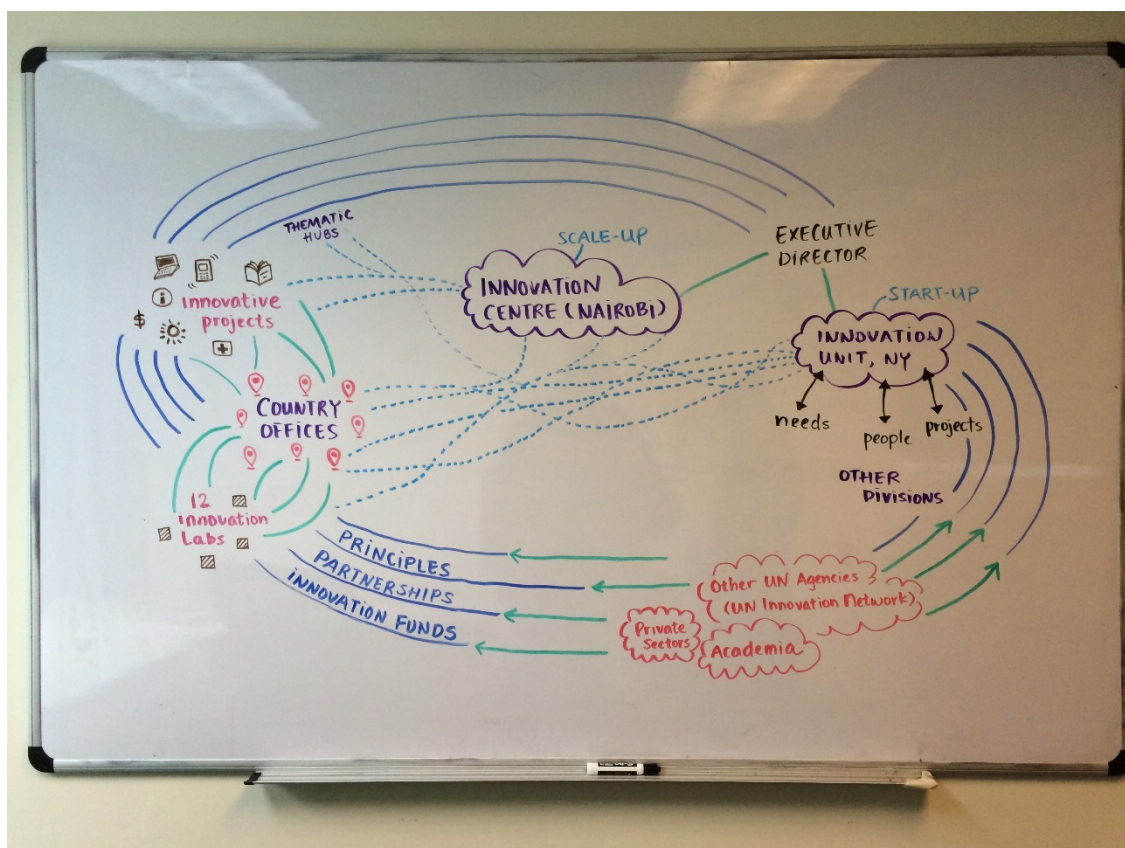
¹⁹ My first collaboration with Christopher Fabian and Erica Kochi dates back to 2007 when they supervised the first in a series of student fellowships via Designmatters at Art Center College of Design: that of graduate student Miya Osaki, who contributed to their work developing UNICEF content for the One Laptop Per Child initiative (for more information see <http://www.designmattersatartcenter.org/fellowship-program/past-fellows/>); other design projects I helped structure and supervise with them over the years include a digital stories design research exploration focused on citizen media that engaged faculty and students from Art Center's Media Design Practices MFA program (<http://www.designmattersatartcenter.org/proj/unicef-sharing-digital-stories-in-the-developing-world/>) and the core partnership for the curriculum of Art Center's Media Design Practices: Field MFA chaired by Anne Burdick, which has relied on the context of the UNICEF Innovation Lab and the UNICEF country office in Uganda (<http://www.designmattersatartcenter.org/mdp-field/>) as a basis for student inquiry since 2012.

enabled me to gain unique access to highly placed informants, as well as immediate credibility among members of the Innovation team, thus allowing me to adhere to the key principle of ethnographic authenticity (Clifford, 1983; Golden-Biddle & Locke, 1993). Additionally, the research site gave me the opportunity to draw upon my prior worldview and cultural experiences as someone who has had a personal acquaintance with the United Nations system of funds and agencies for many years (both as a practitioner, but also, and literally, growing up in the corridors of the UN headquarters in New York and Geneva, as a diplomat's child). The latter familiarity, "psychological closeness" (Geertz, 1983), and experience contributed to my seeing the nuanced culture-producing milieu of the organization (Singh & Dickson, 2002) with a particularly sensitive lens, and helped me craft a plausible account while retaining criticality (Golden-Biddle & Locke, 1993). In this regard, my exploratory research process combined a recognition of the familiar with an openness to the discovery of the novel (McKeon, 1964), and had me wrestle with the paradox of "making the familiar strange" (Hatch, 1993) as I uncovered and sought to explicate the ways in which individuals in the Innovation unit came to understand their situations and take action (Van Maanen, 1979a).

A further rationale for my selection of the Innovation Unit as the research setting for this study is that it exemplified a revelatory, extreme single case (Yin, 2014). The use of an extreme case study facilitates theory building because the phenomena under study are "closer to the surface" and easier to observe (Eisenhardt, 1989; Pratt, 2009). In this sense, the Innovation Unit represented a privileged opportunity to observe first hand and describe a dynamic set of phenomena in a unique organizational context where innovation and design activities intersect.

As the principal unit of analysis in this study, the New York unit is one of the core organizational components of what its co-founders and UNICEF describe as “the larger UNICEF Innovation ecosystem” (see Figure 1). The mission of the Innovation Unit is to support UNICEF programs in finding solutions for the world’s most vulnerable children “through integration of technology, design thinking and partnerships with private sector and academia” across more than 135 country offices globally. This mission is situated within a larger international development context that emphasizes the need for partnership with the active involvement from civil society, commercial enterprises, and private non-commercial actors including academia and social entrepreneurs, to complement, support, and create new models for the delivery of public goods and services, and the creation of sustainable social innovations that can help eliminate inequities for all at a global scale (Sustainable Development Knowledge Platform, 2014).

Figure 14: UNICEF Innovation Ecosystem Diagram White Board Overview



The diagram was used by Innovation Co-Leads Christopher Fabian and Erica Kochi to visualize the organizational structure and key functions of UNICEF Innovation during UNICEF's Executive Director Anthony Lake and United Nations Secretary General Ban Ki-moon visit to Innovation Unit offices at UNICEF headquarters on January 7, 2015. [Photograph courtesy of the UNICEF Innovation Unit²⁰.] A designed version of this diagram is included in Appendix I.

Table 9 provides an organizational overview of the Innovation Unit as well as the other organizational entities that UNICEF identifies as part of the ecosystem of innovation.

²⁰ The photograph and full blog post of this visit can be accessed at <http://unicefstories.org/2015/01/08/united-nations-secretary-general-ban-ki-moon-pays-a-visit-to-the-innovation-unit/>.

Table 9: UNICEF Innovation: Organizational Overview

Organizational Unit	Functions
Innovation Unit, UNICEF HQ, New York Headed by Christopher Fabian Co-Lead, UNICEF Innovation Reports to UNICEF's Executive Director	Supports UNICEF programs and country offices at large through integration of technology, design thinking and partnerships with private sector and academic
UNICEF Global Innovation Center, Nairobi Headed by Dr. Sharad Sapra, Director Reports to UNICEF's Executive Director	Identifies and Field tests scalable innovations
Innovation Node in San Francisco Headed by Erica Kochi, Co-Lead, UNICEF Innovation Reports to UNICEF's Executive Director	Builds partnerships with the technology sector and helps scale social innovation start-ups
Innovation Group, UNICEF Supply Division, Copenhagen Headed by Kristoffer Gandrup –Marino, Chief, UNICEF Innovation Supply Division Reports to Head of Supply Division	Works with private sector and other partners on supply and product innovation
Network of Innovation Labs around the world (14 as of January 2015) The Labs are purposely designed to function outside established organizational reporting structures; affiliations with UNICEF country offices and the NY Innovation Unit as well as reporting of activities vary greatly.	- They are sometimes, not always associated with a UNICEF country office. - They bring together the private sector, academia and the public sector to develop solutions to key social issues. - As open, collaborative incubation accelerators, they scan for the latest innovations and trends at the grass-roots community level. - They engage constituents with UNICEF to facilitate best-in class thinking, practices and applications necessary to enable and expedite systemic, sustainable change.
Regional Office Leads	Individuals who add a regional perspective and support innovation work with Country Offices

Data Collection

I conducted this ethnography over a period of eight months, between June 2014 and January 2015. While I recognize the importance of prolonged observation and “learning by going” [to the field] per Geertz (1973), I follow more recent trends in management research (Singh & Dickson, 2002) and cultural ethnography (Clifford & Marcus, 1986) that no longer subscribe to the researcher’s extended physical presence in an organizational setting as the sole foundational guarantee for interpretative validity and

adequate insights (Sanday, 1979). For this study, my period of in-situ immersion was relatively limited as I was not located at the organization in New York for the entire period of data collection. Instead, I combined my interactions and observations of the behaviors of individuals during the meetings and the events that I participated in during the month of June 2014 at headquarters, with a variety of data that I triangulated to mobilize evidence and elicit meaning from the phenomena of interest (Geertz, 1973). Gathering evidence from multiple data sources addresses potential problems of validity from inferences because different sources provide for multiple measures of the same phenomenon, allowing the researcher to arrive at findings that converge from multiple, independent observations (Eisenhardt, 1989; Yin, 2014). The data I gathered included field observation and field notes, semi-structured and informal interviews, and extant documents and technological artifacts of the organization (the latter included tracking live the RapidPro project as it was unfolding). I describe these multiple sources of data in further detail below.

Field Observation

My field observations included attending routine meetings internal to the Innovation team (see Appendix J for a sample of the researcher's field notes), and shadowing the Innovation co-lead, Christopher Fabian, to meetings with colleagues outside the unit in the month of June 2014 at UNICEF headquarters in New York. This process of systematic and sustained non-participant observation was critical to gain an understanding of the organizational setting of my informants, and gain the ability to start detecting patterns in their activities, relationships, and interactions in the context of their daily social and work lives in the organization. I was also invited to track the unfolding of

the conceptual development, design, and deployment of the Innovation Unit's flagship innovation project at the time of this study: the RapidPro open-source software platform for international development (referred to by my Innovation team as "an app store for development tools").²¹ This subset portion of my fieldwork consisted of a four month period of observation between June and September 2014, when the platform launched to coincide with the United Nations General Assembly. During this time, I attended weekly Skype or conference calls with the RapidPro core team who was globally distributed. The team consisted of Christopher Fabian, the Innovation Co-Lead, and a handful of individuals with expertise in country office program support and deployment, software programming, and design. The location of individual team members varied greatly throughout the study's duration, as they moved between various country offices in East and West Africa and New York during this time. Aspects of the platform's deployment were made more complex as some team members were called in to test applications for the platform in Liberia and Sierra Leone during the height of the Ebola public health crisis in West Africa. During this combined fieldwork at UNICEF New York headquarters and virtual observations of the RapidPro platform, I took detailed field notes and wrote analytical memos after each day's observations, looking for patterned activities and shared interpretations that could be triangulated with other data sources.

Documents and Artifacts

Other important sources of data for this study were the written and visual materials and the artifacts that the Innovation team used to articulate key narratives and

²¹ The RapidPro platform supports UNICEF applications such as U-Report, which UNICEF originally launched in Uganda in 2011 to engage especially youth to participate more widely in governance and policy-making. It was deployed in Liberia within weeks of the Ebola crisis in summer 2015: <http://ureport.in/>

support their work. These documents included organizational published texts such as the *UNICEF 2014-2017 Strategic Plan and Theory of Change Supplements* (UNICEF, 2013, 2014b), the *State of the World's Children 2015: Reimagine the Future Report* which had “innovation for equity” as a core thematic thread (<http://sowc2015.unicef.org/>), and the annual reports of the Unit for the last three years (UNICEF Innovation, 2012, 2013, 2014). I also reviewed organizational websites such as www.unicef.org/innovation (including periodic monitoring of the Innovation Unit's blog, Stories of UNICEF Innovation, (www.storiesofinnovation.org) and was granted access to several internal/ “work in progress” documents of the Innovation Unit. For example, I reviewed several iterations of the *Innovation Handbook*, a document intended to support UNICEF Country Offices and partners in accessing the most up-to date information, connecting to other Offices doing similar work, and developing plans for effectively integrating innovation into country programming. The handbook is purposely designed as a word document to convey the ever-changing nature of its content (author in correspondence with design lead, January 2015) and includes a compilation of resources and tools that provide an overview of the innovation landscape across UNICEF. The shadowing process of tracking progress on the RapidPro project allowed me to access work-in-progress sketches and design files, select internal email memos of the team as they worked on the platform's development, how to instructional materials, etc., before these were finalized and compiled in the RapidPro dedicated website <http://www.rapidpro.io/>. See Appendices C and D for select excerpts of these documents.

Interviews

I conducted twenty-one semi-structured, one-on-one interviews between June and December 2014; these varied between half an hour and an hour in length. The majority of the interviews were face-to-face at New York Headquarters, including an in-person interview of the lead of innovation at the UNICEF Supply Division office in Copenhagen. The remainder handful interviews were conducted over Skype with Innovation team members located in San Francisco, Kampala, Nairobi and London. Since I was keen to collect a pluralism of perspectives from individuals with a diversity of organizational roles within and outside the Innovation Unit staff, I determined the list of interviewees in close consultation with Christopher Fabian, one of the two Innovation Co-Leads. This guidance and in a few cases, facilitated introductions, contributed in no small measure to my obtaining ready access to participants in the study. Table 10 identifies the interviewees' roles within and outside the Innovation Unit (only the three leadership positions that I obtained permission to identify from our IRB interview protocol are associated by name in the narrative). Although all interviews covered the same broad topics, I maintained the ability to explore areas of special significance to an interviewee in depth. Given that my research objective was to understand how design practices and design attitude capabilities related to the principles, practices and programs of UNICEF Innovation and advanced or not that agenda, the design of the interview protocol opened with two open-ended questions that offered organizational context and enlisted background information about the interviewee's position in the organization and their relationship to the Innovation Unit. A core set of interview questions invited participants to share an innovation project or activity and probed specific design attitude

dimensions (such as for example empathy, the ability to connect multiple perspectives, or tolerate ambiguity) that could be present in their approach to their work; questions that enlisted their views about design in the organization and specific work were also included. Concluding questions were open-ended, aiming to get participants to project into the future with a positive note. Appendix C shows the questions used to guide the interviews. All interviews were digitally recorded with participants' permission, and transcribed verbatim by a professional service so that the raw data could be analyzed. In addition, spontaneous interviews occurred when I was observing work, and I also conducted a smaller number of repeated informal interviews and email correspondence exchanges throughout the course of the study with key members of the Innovation team and its Co-Lead in order to be informed of the progress of projects and organizational aims, and to crosscheck facts.

Table 10: List of the 21 Semi-Structured Interviews in the Study

UNICEF Global Innovation Center Nairobi	Dr. Sharad Sapra	1 interview *
Innovation Node San Francisco	Erica Kochi, Co-Lead, UNICEF Innovation	1 interview
Innovation Lab, Kampala	RapidPro Global Product Manager	1 interview
Innovation Group, UNICEF Supply Division Copenhagen	Chief of Unit	2 interviews
Innovation Unit, UNICEF HQ, NY	Christopher Fabian, Co-Lead, UNICEF Innovation Academic Partnerships, Lead and Global Challenge Manager Visual Strategy (Design) Lead team Analyst Roving Lab Lead Innovation Lab Coordinator	8 interviews
UNICEF HQ, NY	Executive Director Office, Field Support Unit Human Resources Division, Strategic Planning Office of Private Sector Partnerships IT Division Humanitarian Response Polio Innovation Program Child Protection Program	8 interviews

* Note: Interviews varied between 45 minutes and one hour in length; the Innovation Co-Lead Christopher Fabian and key members of the design team were interviewed repeatedly in an informal manner.

Data Analysis

The dialectical, analytical mode in this ethnography fundamentally invites the opportunity to grow our understanding in both directions, downward from the whole to the parts, and upward from the parts to the whole (Hackman, 2003) by examining the dialectical forces between the actions of organizational actors and the institutional logics of UNICEF, but also by probing the seeming paradoxical dynamics of alignment and tension that design attitude manifestations generate as they get integrated with processes of innovation and change in the Innovation Unit and the organization at large, or alternatively disrupt organizational norms and institutional logics. The exploration of the cultural milieu of the Innovation unit of UNICEF also aims at creating a space for

deliberation, bringing different kinds of systems into view (Fortun, 2012) by relying on rich detailed descriptions in the narrative and by relaying accounts of key incidents or perspectives shared by our informants. In this sense, I pursued data collection as a means to construct generative theorizing from the perspective of not simply an observer or full participant, but from that of a facilitator, i.e., there were instances throughout my interviews and informal conversations where informants openly commented that questions I would pose or comments that were solicited from our conversations where sparking a new idea or line of inquiry they would be pursuing afterwards. Paramount to my research aims was to drive forth new meaning of the phenomena under examination and give voice to informants by maintaining a high degree of reflexivity about the asymmetries that occur between observer and observed (Fortun, 2012; Golden-Biddle & Locke, 1993, 2007), as well as the subjectivity that arise from personal biases.

In reporting on data, I sought to write an account that 1) honors the worldview of my informants; 2) provides sufficient evidence for my claims; and 3) significantly contributes to extant theory (Pratt, 2009). In this sense, my objective in assembling the narrative of the findings from the study was to achieve a rigorous partiality and an economy of truth about design attitude manifestations in this innovation context (Clifford & Marcus, 1986) over a comprehensive account. While I was keenly intent to construct knowledge with evocative veracity through the presentation of this ethnographic case study, I also realize that I was studying an organizational culture in profound flux “whose natives may have as much difficulty knowing it and living it as the fieldworker” (Van Maanen, 2011) and thus, my responsibility as a researcher following the philosophical hermeneutics tradition was guided by the aspiration to remain open to unanticipated and

unintended developments throughout the study: drawing on the capacity to “see what is questionable in the subject matter and to formulate questions that question the subject matter further” (Gadamer, 2008).

In the process of developing my inferences from within fieldwork at UNICEF, I subscribed to a grounded theory approach of comparison and contrast (Strauss & Corbin, 1990) which amounted to an inductive, recursive process of cycling between identifying initial concepts in the data and grouping them into categories (open coding), emerging theory and relevant literature, in order to progressively build and refine the theoretical categories that form the basis of this paper. Given my ethnographic focus, conceptual coding used whenever possible in-vivo codes, i.e., language used by the participants that I associated into first order codes (Van Maanen, 1979b). I also drew upon a strategy of thematic coding (Boyatzis, 1998) informed by the key concepts related to design attitude brought from my prior research (Schein, 1985, Van Maanen, 1979). In particular, I probed key dimensions of design attitude: connecting multiple perspectives, empathy and ambiguity tolerance (which I had found to carry significant predictive power in accounting for positive social innovation outcomes in my quantitative research) and explored their relevance in the context of this study, using them as key themes in the initial coding stage of my interview data. In a second step of analysis, I engaged in axial coding of the data (Strauss & Corbin, 1990) to develop more abstract descriptions of conditions that applied to multiple situations, combining first order concepts to generate second order themes. Table 11 provides a schematic of the data collection and the recursive phases of data analysis, which continued until I had a clear grasp of the

emerging theoretical relationships in the study and additional data collection failed to reveal new relationships.

Table 11: Schematic of Data Analysis and Collection Steps

Methodological Steps	Outcomes
Study Setting: search for a revelatory setting to observe the manifestation of design attitude capabilities at the organizational level and in an organizational context where design principles and an innovation agenda are articulated mandates	• Access to direct observation of the Innovation Unit work meetings and routines, access to high level informants at UNICEF headquarters and global offices • Opportunity to shadow members of the Innovation Team during conceptual development, design and deployment of the innovation project RapidPro • Access to the Innovation Team internal documents and artifacts
Data Collection: • Observe in situ (NY and Copenhagen) • Close consultation and guidance from Innovation Co-lead to select interview participants across Innovation Unit and organization at large to develop list of 21 interviews • Interlace data collection with literature review and data analysis for iterative /generative interpretation • Shadowing of RapidPro via weekly Skype and conferences with global distributed team • Maintained Notebook to capture notes during observation; wrote analytical memos after field observation • Access to multiple sources of data including extant archival documents, internal documents, memos and artifacts • Informal follow-up interviews with key informants/ to seek feedback from key informants	• Authentic, close relationships with Innovation Co-Leads helped establish credibility and access to high level informants • Rich and authentic data set from fieldwork allowed for emergence of patterned activities • Sub-analysis of RapidPro project allowed for observation and interpretation to occur live as processes were unfolding • Plausible, evolutionary descriptions of practices and processes • Filled Moleskine Notebook (200 pages) with copious field notes and produced analytical memos
Data Analysis Phase 1: Discovery and Narrowing • Engage in thematic coding based on insights from prior quantitative research to probe design attitude deeper at the organizational unit of analysis • Construct categories/ categorize data via in vivo codes and 1st order concepts from fragments/record categories in journal Phase 2: Enriching and Validating • Explore how categories fit together / probe relationships and patterns • Examine extant theory for insights • Use of constant comparison to test for rival explanations, search for contradictory evidence, and continuously refine thematic categories via axial coding • Use dialectical mode of inquiry to interpret how design attitude manifests and make sense of paradoxes in the phenomena and create a space for deliberation with data	• Emergence of patterned activities from fieldwork observation • Thick Description of the Organizational Culture of the Innovation Unit • 1st order codes/axial codes/list of entrepreneurial themes and attributes that emerge about the Innovation Unit and examples from the interviews • Use of dialectical strategy to organize a texture of contrarities from the themes that emerge from the design attitude probes: pluralism of meanings; confirmation of 3 dimensions of design attitude: wins versus barriers in organizational context • Emergence of theoretical categories of accountability and urgency

Findings

The findings of this study are organized in three subsections. The first subsection offers a contextual overview of the Innovation Unit that focuses on a “thick description” (Geertz, 1973) and analysis of two components of the unit: its structure and program foci. My objective is to uncover the special language, unique and peculiar problems, and distinct patterns of action of its members (Van Maanen, 1979b; Van Maanen & Barley, 1982) and highlight some of the *particulars* of the unit’s organizational culture vis-à-vis the larger institutional logics of UNICEF overall in order to arrive to a picture of the *whole* unit. The second subsection addresses the first research question of this study and probes how design attitude dimensions manifest and play out within the Innovation Unit to advance collective agency at the organizational level. The focus of my examination here is threefold. First, I review the principles of the Unit and their intersection with design practices. Second, I examine the pluralism of manifestations of design attitude, and third, I analyze the enablers and inhibitors that design attitude manifestations face in the organizational context of UNICEF. Finally, the third section of these set of findings highlights the insights I cull from the second research question of this inquiry: the relationships that can be discerned between design attitude manifestations and two macro level themes: accountability and urgency. These themes emerge as important drivers in terms of how reasoning and actions that impact innovation take place within the institutional logics of UNICEF.

I. Mapping the Context: An in-depth view the UNICEF Innovation Unit

Organizational Structure: A Startup Environment

Here, I review the structural component of the unit via three main attributes that contribute to forming the start-up environment or “subculture” of the Innovation Unit: 1) its relative autonomy and cross-cutting position in terms of where the Unit sits in the organizational and reporting chart of UNICEF; 2) the demographic make-up of its staff; and 3) the entrepreneurial characteristics of its operations—the unit’s activities representing “ground zero for innovation” at UNICEF.

A Privileged Position at the Center of UNICEF’s Innovation Ecosystem

In its relatively brief eight-year history since its start in 2007, the Innovation Unit has undergone several cycles of ebbs and flows in terms of the size and composition of its staff, its reporting structure within the organizational context of UNICEF, and the nature and scope of its activities. The Unit is the brainchild of its two co-leads, Christopher Fabian and Erica Kochi (Kochi moved to San Francisco recently, in late 2013, to start the node of the unit in closer proximity to the technology startups of Silicon Valley). When they joined forces in the mid-2000s, they were relatively new program officers in the organization, working in the Communication Division of UNICEF to explore a variety of innovation initiatives with the support of the head at the time of the Communication Division, Dr. Sharad Sapra. Back then, the idea of using new technologies, forging partnerships with the private sector, and integrating a design attitude approach to strengthen UNICEF’s innovation mandate around the world, represented a very novel concept for the organization (UNICEF Innovation, 2014). Perhaps indicative of how much the readiness for innovation has seemingly changed since then, presently as Co-

Leads of the Innovation Unit, Fabian and Kochi collaborate with a globally distributed, interdisciplinary team that includes designers, who are all part of the larger “innovation ecosystem” of UNICEF described earlier (see Appendix I). Importantly, both report now (and since late 2013) directly to the top of the pyramidal structure of UNICEF, the office of the Executive Director, Anthony Lake, who has been very deliberate in his promotion of the innovation mandate of the organization since he assumed his tenure.²² As a deputy for Lake offered: *“he is genuinely interested in the work they do and very much engages with them on a substantive level.... Their reporting is not a paper thing.”* Another informant in charge of strategic programming in human resources built on the importance of the legitimacy and license to act they enjoy, which inherently results from having that top executive level commitment, an opinion that was echoed by another staff member: *“the fact that they have a channel to the executive director empowers them.”* However, as the HR informant also pointed out, that same leadership endorsement can provoke at times a set of antagonistic dynamics: *“when you have that leadership from the top that takes that tone, it has two main reactions: there is a group of staff who will push back, but may be not vocally or physically... just a lack of cooperation, or making things taking a long time to be responded to. On the other hand, you have people very excited and see that this is really a way to grow, and develop, and learn new things, and really embrace it. Then the challenge is both when that senior leadership leaves, what happens?”* Both

²² All of the UNICEF official documents studied include a clear articulation of the importance of innovation as part of the institutional logic of the organization for the 21st century. As we concluded the writing of this chapter, we were able to review Anthony Lake’s speech to the Executive Board of the Organization (2/03/2015) which situates the innovation agenda as part and parcel of the organization needing to maintain essential relevance in a changing world: *“we can look at this as a challenge or as an opportunity—an opportunity not to evade this new world and its complexity, but rather to embrace it and to use the changes around us to forge new partnerships, new collaborative efforts, new ideas, new solutions and new movements...”* (Unpublished address, courtesy of the Communication Department, UNICEF Innovation Unit, accessed February 3, 2015).

Co-leads, agreed about the “double edge sword” and “polarizing” aspect of the reporting structure with the executive director’s office, but also emphasized how liberating the structure is in terms of agency; as Kochi remarked: *“most people at our level have a couple of layers between the executive director and their office. And we don’t have that. ... The thing that is really good about it is the ability to work very well across all divisions and countries because we are not affiliated in that we don’t have a loyalty to any particular division. ... We are really seen as very cross-cutting work.”*

Mobility and Diversity in Its Demographics

It is insightful to examine the demographic and skill-set make-up (including that of designers) of the unit to assess whether this informs the startup organizational culture of the Unit. From a human resources perspective, the technology heavy focus of activities of the unit seems to attract a relatively young demographic of professionals, typically under forty years of age (Amatullo in dialogue with Fabian, June 2014) who tend to join the team with sharp skills and prior expertise from a mix of public and private sector professional backgrounds (including international development and policy, health, management, data visualization technology, communication and design). Except for the case of the Co-Leads and a handful of core positions in the unit, most of the team members are not full-time permanent UNICEF staff, but instead they are hired on “temporary appointments/ consultancies.”²³ There are also some indications in the data of this study that the younger nature of the staff that come to the organization with technology “savviness” and entrepreneurial traits may also be representative of a broader

²³ Contractually, per UNICEF human resource policy these appointments typically may span two consecutive cycles of eleven months each with a month interval in between, so in many cases temporary staff is likely to cycle out of the organization after two years.

change in the demographic patterns that are impacting organizations like UNICEF as a whole, where older generations are retiring, and being replaced by a new generation. In the words of the Innovation Co-Lead, Kochi: *“The new people think in a very different way and are much more antiestablishment than their predecessors. They realize, especially from the technology face of what we do, that there is going to need to be change in the way we practice the work we do.”* As our interviews revealed, the background and mobility of the staff has a significant influence in contributing to the openness and dynamic energy of the unit, as the HR informant noted: *“those people are coming in, and then they are going. So in terms of their thinking, they tend to typically be more agile and less risk-averse.”* Careful attention is also placed in distributing staff across the organization (via dual reporting structures to the Innovation unit and other divisions and by tapping into organizational budgets that are sitting outside the budget of the unit). Along with the direct line of access to the Executive Director’s office mentioned above, the hybrid reporting structure of many of the unit’s positions can be considered an important strategy of integration of the unit; especially as a way to embed a design attitude capability across the organization that contributes to a crosscutting influence and institutional legitimacy. One of the Co-leads, Fabian, exposes this perspective in the following statement: *“the biggest marker of success is that this team is funded by the organization.... I have a cool boss and he is the head of the organization. And the previous head of the organization was the one who gave our team the space to do a lot of this in the first place. So it’s actually transcended to leaders.”*

Ground Zero for Innovation

From an operations standpoint, despite many additional factors that demonstrate the integration of the unit within UNICEF's organizational structure through visible products, services, and tools that bring concrete value to development needs in areas as diverse as health and education for example—where a number of innovation initiatives have reached proof of concept and varying levels of maturity, scaling throughout the organization and key country offices (UNICEF Innovation, 2014)—the unit stands out as a “startup subculture” (Martin, 2002a) that is often operating under different institutional logics than the rest of organization. As one informant outside of the unit remarked: *“we are still at zero in terms of mainstreaming and to me mainstreaming innovation as a way of doing business is still very much centralized and focalized with the innovation team.”* The emergent nature of the unit's processes and activities is echoed also in this testimonial from one of the project managers in the Innovation team: *“it's taken a lot of steps, especially recently to sort of operationalize innovation and to create a framework that people can identify with.”* The qualifier “startup” in this situation can be equated with an overall competence for institutional entrepreneurship of the unit that also converges with design attitude capabilities, and that I define as three main actions that demonstrate the proclivity toward agency and the creation of new value for the organization through 1) the development of new products, processes and ventures; 2) a boldness for experimentation driven by an intrinsically motivated staff; and 3) calculated risk and “opportunity-focused” actions to leverage change (Drucker, 1985). The entrepreneurial outlook of the unit, not dissimilar to one we would associate with a private technology startup, differs from other more “dominant” (Williams, 1977) traits of

the organizational culture of UNICEF as a whole, which overall is less prone to innovation, despite emergent signs of change. The competing institutional logics are evidenced by the statements of several of the interviewees that referred to the bureaucratic stasis that might be expected in a public service institution that still has to function and contend with many of the hierarchical, “command and control” management systems and normative procedures designed for an organization established shortly after the Second World War (Jolly, 2014). As one of the senior administrators with management oversight for the unit shared: *“Any large bureaucracy and particularly United Nations bureaucracy has its organizational inertia and its organizational resistance to change.”* And later in the same interview: *“I play cover, I run blockage for them on the bureaucrat... my job is to be part of the old school internal bureaucracy and make sure that it does not shun the unit, make sure it works to support it.”* Another executive-level informant offered a very similar image of bureaucratic behaviors of many staff that may show resistance to change and innovation: *“They have been here for a million years. They know what is going on and how to fight back. So they try to resist to change in every way and means possible.”* Table 12 illustrates the institutional entrepreneurship quality of the Unit and summarizes the typology of associated first-order concepts that represent a set of three general actions described above along with second-order emergent themes and representative quotes from our interviews. It is important to note that qualities of entrepreneurship that emerge from the field data such as ambiguity tolerance and experimentation/iteration practices for example, are also characteristic of design attitude dimensions and design practices. Appendix J includes an excerpt of field notes from our observation of one of the weekly meetings; the session

was also revelatory of the entrepreneurial values, practices, routines, and language of the team (Martin, 2005).

Table 12: Entrepreneurial Competence of the Innovation Unit

Associated 1 st Order Concepts ACTIONS	Second Order Themes from the Data	Representative Quotes
1. leverage of resources to create new products processes, ventures that add value	- Expectation for agility - Accelerated pace of delivery - assumption /positive orientation for change versus dominant culture	<i>"Because we are a UN bureaucracy change is difficult. It is hard to push change through and I think people who are change agents like Chris and Erica and I'd like to think of myself in that category can get very frustrated with moving things along." Field Support Unit</i> <i>"My role has changed like two times already in the last year." Design Team Member</i> <i>"We have a lot of high turnover and expectations for quick demands... we have to be able to make things in a very intuitive way" Design Lead</i> <i>"We are looking at the places where we do not have all of the answers yet and the industry does not have all the answers." Erica Kochi, Innovation Co-Lead</i>
2. Boldness for experimentation	- flexibility/iteration - independence - ability to anticipate - intrinsic motivation of staff	<i>"The upcoming generation of staff are young people in their 20s and 30s who are much more antiestablishment than their predecessors." Erica Kochi, Innovation Co-Lead</i> <i>"At the beginning I was waiting for direction and that was too slow.... Nobody is telling us what we are going to need" Visual Strategy Lead</i> <i>"One strives for freedom"</i> <i>"This team stays together until whenever to finish something, it's wonderful."</i> <i>Chris Fabian, Innovation Co- lead</i>
3. calculated risk taking and opportunity focused actions	- learning from failure - strategic experimentation with proof of value aims - calculated risk	<i>"It definitely has been able to achieve using it as a global weight, doing a lot of exciting new things and being OK with failure." " Academic Partnerships Lead</i> <i>"Innovation implies a much more sophisticated understanding of risk, the ability to accept a certain level of risk and to justify the gains that come from it"- HR Strategy Lead, UNICEF</i> <i>"Gradually we kind of prove the effectiveness and the impact of these programs and innovations... people are buying more of these ideas" Roving Lab Lead</i> <i>"It is tricky to strike a balance, especially in international development of being in a place which has great impact and flexibility to do new things"</i> <i>"We don't run off with an imagination of what the product can do but the reality of it as well" RapidPro Programmer</i> <i>"The work we do is very cross cutting, it has to be about serving the whole organization." Chris Fabian, Innovation Co-Lead</i>

Evolving Programmatic Foci

Below I review the unit's programmatic foci; their fluid and shifting orientation represent another aspect of the extremely agile and entrepreneurial nature of the unit. I also signal how the entrepreneurial dimensions of their programming are also informed by some of the institutional logics of UNICEF as a whole as it responds to macro-level shifts in the global context it operates under and embraces changes that are impacting the "necessary machinery of the UN bureaucracy," as one informant referred to it.

Swift Action

Swift action as a *modus operandi* characterizes the attitude the whole team of the Unit has, starting with its leadership, as demonstrated by the following statement of one of the Co-Leads, Fabian: *"what we are trying to do is build the biggest change agent that we can."* The sentiment that *"we are not moving fast enough, I want to go faster,"* is one I encountered repeatedly in my interactions with other members of the unit. Agility is also part and parcel of the expectations the Unit has for how design has to perform; Mari Nakano, a professional designer and the Visual Strategy Lead (the unit includes a small Visual Strategy team), purposely not named "the design team" (Amatullo in conversation with Fabian, September 2014) illustrates this case in point with this quote:

"We practice agility with our communication methods – one minute we need to create work that speaks to the Executive Director or even the UN Secretary General, the next minute we are preparing to display work for private funders. We toggle between the print and digital world and we also practice designing with constraint – If the internet is slow in a country, how do we still disseminate information that is accessible? If Adobe Creative Suite is not practical, then how can we maximize Microsoft Office? If Google isn't accessible, then what's the next best way to share working documents? How do we grow and progress without letting too little or too many choices slow us down? How do we continue to create strong design work under the pressure of time?"

It is important to add that “the swift action” imperative also emerged from informants outside the Innovation Co-leads and members of the unit and in this sense it seems to signal the theoretical theme of urgency that we discuss later as part of the institutional logics of where UNICEF is at this point in time of its history. This statement by the deputy advisor of the Executive Director of UNICEF illustrates how connected the imperative of swift action is to the institutional logic of urgency that is dictated by the macro level considerations that UNICEF contends with: *“My general approach to problem-solving is always to start with the data... You’ve got to have a strong basis data and then you’ve got to have a good analysis of that data.... Now I realize there are situations there’s a pressure and urgency that doesn’t give you the luxury of the time to really collect a lot of data. So you have to do that in parallel. So you start collecting your data and you start acting”* [my emphasis on “acting”].

Motivational Narratives

Importantly, in keeping with the concept of institutional entrepreneurship, programmatic activities, even when novel and not mainstreamed, are presented and framed in a motivational way that attempt to effectively resonate with values and interests that fit with the institutional logics of the overall organization and thereby harness consensus effectively (Battilana et al., 2009).²⁴ Here, it is significant to note that

²⁴A quick overview of the unit’s published annual reports show that the innovation foci for 2012–2013 where articulated as “four key areas of innovation: programs, processes, partnerships and products that bring about better, more equitable results for children,” in the annual 2013–2014 report these foci remain present, but are further captured as “access to information, opportunity and choice” with innovation initiatives framed in three broad areas: 1) models for accelerating innovation: including guides, frameworks and partnerships to create sustainable solutions at scale; 2) systems and tools that address the needs of the most vulnerable; and 3) research: loosely defined as operational and strategic, modeling new solution spaces as well as creating a 3 to 5 year future oriented portfolio of projects in real time data, infrastructure, logistics and personal information (see unicef.org/innovation).

the design expertise that is embedded in the unit serves drive the motivational framing for innovation that the unit deploys to validate its work. It is a perspective openly voiced by one of the Co-Leads, Kochi: *“I think design really helps in terms of communication about trying to make our team much better at articulating what it wants to communicate in an upbeat and engaging way.”* Part of the ability and self-awareness for constructing motivational narratives that the leaders of the Innovation Unit have translates in their also recognizing the importance of tying the narrative to the institutional logics not only of UNICEF overall but of the private sector stakeholders that UNICEF and the Innovation Unit are increasingly engaging in as development practices change and engage private sector. Here is a testimonial by Kochi that illustrates this point: *“I think you really need to spend time to get to know what drives the organization that you’re working with. And that’s a process that is not sure and it sort of happens over time... the process of aligning incentives on both sides [we our external partners outside the unit and outside UNICEF] is important and without that, it’s very hard to have a good lasting partnership.”*

The image of the unit as a driver of institutional change, partly due to their ability of establishing such novel partnerships with the private sector, also coincides with the construed external image that UNICEF staff have of the unit, who see its members as important advocates and facilitators of change activities. The following statement from an interviewee outside the unit is indicative of this perception: *“They have a lot on the boil, on the go at the moment.”* It is also telling to observe that the sense of a continuous forward motion through the dynamic approach to the programming of the Unit’s activities is clearly evident in how its members identify with an entrepreneurship image that is different from the rest of the organization (Dutton, Dukerich, & Harquail, 1994).

The organizational identity of the unit suggests a sense of distinctiveness predicated on an idea of a fluid, “liquid” state—a hallmark of a design attitude approach (Boland & Collopy, 2004)—that is characterized by constantly evolving circumstances of rapid change. One of the unit’s designers, described it as *“sometimes I feel like we’re stereotyped as being crazy and innovative... these young people running around UNICEF trying to make a bunch of innovations.”* During my field observations there were several moments where I witnessed how much that acceptance of change that members of the unit assume to need in order to operate successfully, seemed part of the organizational culture of the unit. For example, in describing a new activity underway one of the members announced: *“here is an idea we had, it is new, yesterday kind of new.”* There was also the accepted notion and reflective awareness (the latter quite palpable from the perspective of the leadership of the unit) that whenever the priority for activities need to shift or change, the team must adapt or move on. One of the co-leads, Fabian, used the following metaphor: *“like the shark can’t actually stop swimming or it dies because it needs air flow through its gills, the team is like that. If this team stops delivering, then it’s gone, or if we have nothing to deliver against, then it has to be gone.”* Finally, it is interesting to observe that the impetus for change that is articulated in a very concrete discourse and motivational narrative by the Innovation Co-Leads is one that is clearly inspirational to the members of the unit as illustrated by this informant: *“A key mandate I have is to stimulate dialogue around some of the issues we are facing. And Chris [Fabian] calls it ‘like building a global change agent.’”* They also realize that the motivational narrative is important to add legitimacy to the innovation and design work as reflected by this testimonial from one of the Innovation Lab Leads: *“We have*

figured out how to add value concretely to UNICEF and add value concretely to programming for country offices. I think that our team has spent a lot of time thinking about change management that is inherent in what we are doing here within UNICEF.”

This desire to make the argument for innovation and design to become visible and “concrete” is of course closely associated with the importance of having legitimacy as part of the institutional logics of the organization, which emphasize urgency and accountability at scale. One of the informants from the Innovation Unit expresses the importance of this concern in terms of justifying decision-making and action: *“I had projects that I manage at the country level and I focus on concrete programmatic outcomes. We need to do the same with innovation, so looking at something we can isolate and demonstrate correlations between the new solution and the expected outcomes in terms of improved effectiveness, efficiency, scale and reach right? And in terms of systems level change.”*

Erring on the Side of Fluidity and Change

Finally, the institutional entrepreneurship identity of the Unit is reflected in documents and narratives that are purposely designed to be easily changed (e.g. the Innovation Handbook) in staff titles, roles, and responsibilities that can fluctuate in a short span of time (one of our interviewee’s belonging to the design team of the unit commented on this when citing her title *“actually my role has changed two times since I started work here”*), and at more substantive level, in the organizational structure of the unit itself. The Co-Leads seem to intentionally not to want to adhere to any kind of formal structure for too long before finding a way to switch things up. For example, just in the span of the eight months of this research, I was able to see the visualization of the

Unit's structure and activities change in a significant way, shifting from a visual articulation that emphasized the breakdown of activities and distributed roles of the Unit and its links to UNICEF as a whole (organizational chart 1, June 2014, Appendix I, Figure I1) to a diagram that stresses the Unit's position in the ecosystem of innovation at UNICEF (organizational chart 2, January 2015, Appendix I, Figure I2). The agility again of the structure is seen as a positive that is also responsive of the larger changes the organization has to contend with in terms of the nature of the complexity of world problems and circumstances, which in turn influence the institutional logics of UNICEF. As Fabian states: *"One of the greatest things that we are changing in the organization – and it is not this team changing it, the world is changing it, is that we have this idea in development that you can plan something out for like a four-year project plan and this is what's going to happen. That's crazy."* There is an acceptance of this "nimble" nature of the Unit's make up by the staff, and notably by the design team: *"Who we are is always a work-in-progress."* The focus on change also translates and relates to more macro-level considerations that Innovation Unit members seemed very cognizant of and quite reflexive about from the evidence of several of my interviews with them as illustrated here: *"There's the programmatic outcome level and then assisting change level and we are contributing to both...Is there a push to the new normal as a result of the way our team works and at the mere presence of our team? That's obviously a much bigger thing that our team alone could measure but it is something the organization will eventually be able to look at."*

Table 13 provides further evidence of these three key second order themes (swift action, motivational narratives and erring on the side of fluidity and change) that emerge

from the data about the *modus operandi* and approaches that characterize the Innovation Unit in its programmatic foci.

Table 13: Data Supporting the themes of “Swift Action,” “Motivational Narratives” and “Fluidity and Change”

Second-Order Themes from the Data	Representative Quotes
- Swift action	<i>“The work we do day- to-day in emerging areas really looks at how instant the practice of international development can, needs to change over the next two years.” Erica Kochi, Co-Lead Innovation Unit</i> <i>“The fail-fast, fast-fail-early philosophy that we apply to the specific innovation projects we need to also apply the philosophy to the management overall of the innovation program [in the organization]. Deputy Director, Executive Director Office, UNICEF</i> <i>“We are looking at the places where we do not have all of the answers yet and the industry does not have all the answers.” Erica Kochi, Innovation Co-Lead</i> <i>“Everybody is over-stripped, it is difficult to have dedicated time to collaborate and reflect, discuss on more than a monthly basis.” RapidPro Team Member</i>
- motivational narratives	<i>“So we’re looking at the spaces where we don’t have all the answers yet and the industry doesn’t have all of the answers, but we see tremendous potential.” Innovation Co-Leas, Erica Kochi.</i> <i>“I feel like a longstanding bureaucratic organization, we sometimes get stuck in terminology, we [Innovation Unit] use a certain way of thinking about all of these problems, engaging students [through academic partnerships] really allows us to drive new talent and drive new thinking around these longstanding problems.” Academic Partnership Lead</i> <i>“I think the solution is about culture and about rhetoric and about the way you define people’s jobs when you bring them.” Polio Lead</i> <i>“It means you have buy-in. So unless you consult with people and bring them on to collaborate they’re not going to buy into it.”</i> <i>“I think that when people feel that they’re not alone in doing it; that they are part of a bigger team and just a bigger thing... I think that will enable us to continue strengthening as we expand.” Academic Partnership Lead</i>
- Erring on the side of fluidity and change	<i>“You need to be intellectually honest about the necessity for evaluation of this... as a success or as a failure. I think if it’s a failure, understand why it is, and move on to the next generation of it.” Erica Kochi, Innovation Co-Lead.</i> <i>“It’s a very sort of free environment [Innovation Unit] everybody has a lot of autonomy to do whatever they want and while on the one hand that can be a little scary, I think on the other it really gives you the space to grow and take your projects wherever you want to take them.” Lead of Academic Partnerships</i> <i>“We know that the business as usual approach is not as effective as it could be and so that alone I think is a justification to try [and fail]... and to get people to become comfortable with that logic.” Innovation Lab Lead</i> <i>“At this point we can no longer be risk adverse because everything else has been done and everything has to be new.” Polio Lead</i>

II. The Confluence of Innovation and Design

This second subsection of our findings focuses on the initial research question that guides this study: revealing key manifestations of design attitude within the innovation practices of the Innovation Unit and the innovation ecosystem at UNICEF and its overall collective agency. I start with a review of the principles of the unit, which I find align closely with design-based tenets and practices, then I present the pluralism of manifestations that characterize how design attitude manifests in the data, and finally I highlight the key mechanisms that emerge as enablers or inhibitors of design attitude manifestations in this study.

Principles

Principles can be considered beginning points and guides to conduct that should be followed. The work of the unit follows a set of nine principles “for innovation and technology in development” which are “not intended as hard and fast rules but meant as best-practice guidelines to inform the design of technology enabled development programs” (UNICEF Innovation website). Endorsed by a consortium of key international development organizations,²⁵ they function as a code of ethics that guide the work of the unit. Appendix L includes a list of the Principles and the dimensions of each. The language and the key concepts of the document are closely aligned with common assumptions of design-based practices. The two following examples illustrate the connection with design: Principle 1) “design with the user” relates to the value of human-centered design and participatory design practices, and places emphasis on concepts such as iteration, prototyping, and user aspirations. Principle 9): “be collaborative,” in turn

²⁵ Endorsers of the Principles include USAID, Gates Foundation, EOSG Global Pulse, WFP, WHO, HRP, OCHA, UNDP, SIDA, IKEA Foundation, UN Foundation, and UNHCR.

highlights the opportunity for working in an interdisciplinary fashion and seeking a diversity of inputs. Per our interviews, the principles' framework seems to resonate as effective. As one informant commented: *"It doesn't always lead to something concrete, but the fact the organization has embraced this philosophy is really valuable. When Chris and Erica released this set of principles, people looked at them and said, oh these are clever.... it is an enormous shift from business as usual."* The field data and interviews with informants revealed that the principles are embodied in the activities and day-to-day conversations of the unit in a substantial way; they were present in organizational scripts, discussions in meetings, etc. For example, Principle 8): "do no harm" in many ways connects strongly with the institutional logic of UNICEF as a humanitarian organization that has a lot at stake when failure occurs. In this sense, the principle of no harm-doing is closely tied with a notion of failure that relates to the necessary learning that innovation processes entail: *"I feel lucky to be working closely with a team here and our team globally that does very much embrace failure. I think we have to be cautious, particularly in the partnership side of things, is other people; there are other players in that, so to fail among ourselves it comes with a component of do no harm out of respect for the other institutions that you're partnering with."* And in another testimonial: *"the work is considered and is thoughtful and we're really thinking about outcomes and how users are responding and impacted."*

A Pluralism of Manifestations

The field data of this study points to a variety of interpretations of how design functions institutionally at UNICEF, what its "place" of discovery connotes, and what its perceived value is. These views range from an understanding of design as a broad,

“central” organizational capability and creative approach to problem-solving that both designers and non-professionally trained designers in the organization may carry out in a systematic manner, removed from traditional design realms of design practice (what can be qualified as fourth order design per Buchanan) as demonstrated in this quote by one of the design leads, “*We are a natural part of the ecosystem [of innovation] here,*” to considering design as “peripheral” and the purview of designers as producers of specific artifacts, with a strong bias towards visual design (what would correspond to first- and second-order design per Buchanan’s framework) (Buchanan, 2001c; Junginger, 2009). The global head of IT for UNICEF referred to the “central” and strategic function of design, when commenting “*design is something for the future. It’s there more to tell me how in the future.*” Instead, this other statement by one of the design team members points to design’s limited agency: “*I wish there could be more designers involved in the whole project building and program building processes...conveying our value by being really an integral part of the whole brainstorm.*” The same informant’s interview also points to the recognition for the potential of design attitude to advance the call for change that emerges from the institutional logics of the organization at large as one also qualified by struggle. The following statement with one of the IT Leads for the organization speaks to that sentiment: “So now for those innovative solutions to come into that design is a challenge because when you talk about the global organization distributed all over the world with a particular aim, to change the design from A to B, it takes money, time an effort.” This pluralism of meanings leaves design’s positioning in the organization in an ambiguous place, one in which the boundaries of design are far from clear and where its links to the organization’s strategy can fluctuate greatly. Certainly, while the central,

integrated role of design in the Innovation Unit seems to emerge clearly as a capability and cultural value embedded in the unit, it appeared often less understood in other divisions of the organization. The Lead Designer from the Innovation Unit confirms this variation of places, and the tensions they can elicit in the following: *“From my perspective, the innovation unit’s already cultured in it and everybody knows design is important for the unit. But for UNICEF in general, I think we initially were looked at as this outsourcing place, where people could call and say hey, could you lay out our report? We are instead really trying to develop a culture of how design is important in UNICEF.”* The struggle to make design more integral to the core mandate of the organization is further evidenced in a statement shared later as part of the same interview: *“There’s a thought of pushback of what we are willing to do for a requester versus not and in the end, I think, we kind of are trying to change the culture by really pushing.”*

Enablers and Inhibitors of Design Attitude and Innovation

I found that the three first-order dimensions of design attitude that I directly probed in the interview protocol of this study—ambiguity tolerance, connecting multiple perspectives, and empathy—were readily accounted for and recognized as valuable in the practices of innovation of the unit (in fact many of these capabilities overlap with traits that coincide with the entrepreneurial profile of the unit see Table 12). In addition, these three dimensions of design attitude were associated with tangible modes of problem-solving that were also recognized as valid triggers for innovation practices elsewhere in the organization—although they were not necessarily identified as design knowledge capabilities. In this sense, they represent what I would call unquestionable “wins” for the agency of design and design attitude across the organization, beyond the Innovation unit.

Important mechanisms or “enablers” that make these dimensions successful in advancing processes of innovation in the organization emerge from my axial coding of the data and are presented in Table 14 along with representative quotes.

Table 14: The “Wins”: Design Attitude Manifestations

Design Attitude Dimensions	Second Order Themes ENABLERS	Representative Quotes
Ambiguity tolerance	• Ability to embrace change • Ability to embrace discontinuity/failure • Iteration	<i>“A lot of time is spent preparing for things that do not exist.” Lead Designer</i> <i>“The ability be agile and flexible much more than we are is going to be a survival, a critical success factor for the future.” HR Strategist Lead</i> <i>“Our success comes from taking risks and we push those words a lot, that vernacular.” Design Lead</i>
Empathy	• Concern for people • Ability to communicate with users • Ability to work with top-down processes	<i>“Human-centered design, the value if pretty obvious...if we come in and we have the solutions and we push them down and then they don’t work.” Polio Lead</i> <i>“The whole design thinking of man and machine interacting between technology and human beings, whatever you want to call it, I think it is very important.” Innovation Lead, Supply Division</i> <i>“UNICEF is excited about the whole design thinking, human-centered design process”</i> <i>“They are offering entirely new tools in that they were designed bottom-up.” Project Manager Lead, Child Protection</i> <i>“The designer is important to Innovation and UNICEF and needs to yet be fully recognized as a kind of translator between program officers and developers so that they can communicate the needs in a more human way.” Lead Designer</i>
Connecting Multiple Perspectives	• Ability to see the whole situation • Ability to deploy analytic and synthetic perspectives • Ability to be effective communicators	<i>“I think design is bringing new thinking around some of the bottlenecks that we’re facing as an organization Innovation Lead Academic Partnerships</i> <i>“They are great communicators. They share and that is a practice, a philosophy or principle that people say that, but they [innovation team] do it. They say, Oh, you like this, take it, use it. You know, disseminate it. So I have used info-graphics they have produced. I have used design elements they produced, which are helpful.” Business Analyst for UNICEF</i> <i>“We have to make design very intuitive.” Designer</i> <i>“Sometimes it is very vague what they want and we are the ones mapping the process and serving as facilitators.” Designer</i> <i>“Having the design presence changes the way we can view things.” Innovation Co-Lead, Kochi.</i>

The two other dimensions that I did not probe directly in the protocol of questions—creativity and aesthetics—also emerged as capabilities that were embedded in the projects and practices of the Innovation Unit. Perhaps not surprisingly, these two dimensions in particular generated two sets of polarizing reactions. On one end of the spectrum, they were associated as enablers that contributed to the motivational narratives of the unit and to its perception of a successful change agent within the organization. The following quote from the Child Protection Lead outside the unit corroborates this positive view: *“the aesthetic part [of design] is definitely useful... there’s a need to refresh our work [at the UN] and make it seem a little more ‘in the now.’”* One of the co-Leads of the Unit, Fabian also echoes the perspective: *“to me it is people who can create an instance of an idea that can attract everybody.”* The term “creativity” did not necessarily emerge in many of the interviews with informants. But, when it did, it seemed a dimension clearly recognized as part and parcel of innovation and the mandate of the organization as a whole as it embraces a strategy of innovation for development. This is clearly stated by the deputy director in UNICEF’s Executive Director Office: *“creativity is of course vital. None of it works without creativity—even if it’s not the only driver of innovation. It is a pretty important driver and creative response to demand. I mean it’s two things and creativity is the supply side of innovation.”* By contrast, these dimensions also seem to be perceived as counter to advancing processes of innovation, because they were associated with a less strategic and more peripheral role of design as discussed above; the designers in the unit especially seemed very self-conscious of the aesthetics dimension as a barrier, associating it with an emphasis for depicting design as a form-giving or styling pursuit:

“we need to be conveying our value not as people who can just make pretty things linked to visual design.”

Furthermore, and more broadly, I also observed significant limitations of design attitude manifestations within the processes and practices of innovation of the unit. There were many instances where the tensions and contrarities produced by what seems to be a lack of common understanding for the capabilities of design, or simply a certain “invisibility” of design as a potential driver of change in the organization resulted in inhibitors or barriers to design’s agency. An illustrative point is offered by one of the lead developers of the RapidPro application, who expressed his frustration with a tendency to pigeonhole design and rob it from its full potential: *“I would definitely like to get the design team away from just becoming a team that’s creating UI collateral and more around this type of strategic thinking.”* There was also evidence in my interviews with individuals outside the Innovation Unit that design was a novel commodity in addition to being perceived somewhat of as a foreign concept. This is illustrated by this informant’s comment, a senior program officer in the organization: *“So this whole concept of design was very much a thing of the private sector but to us in the development field, we only started talking about design like five years ago.”* A related factor accounting for situations where design encounters barriers to being integrated at a strategic level to advance innovation initiatives (many of which will have a technocratic bias) may be associated to circumstances when there is a lack of understanding or value for the role of design as a discipline in the organization. This testimonial by the lead designer of the Innovation Unit makes the latter point: *“I realize that they don’t really understand the value of it [design] as much. Because they are not exposed to it, they’re kind of doing*

things similarly but then a lot of times they're skipping the design part or the designer.... They will just go to the developer who can build the functionality... but he will not always have a sense of the actual people that will be using the technology."

Table 15 presents the second order concept of inhibitors that impact the ability of design attitude manifestations to advance innovation processes in the organizational context of UNICEF along with representative quotes that illustrate the polarizing tensions that ensue.

Table 15: Design Attitude Limitations

Design Attitude	Second-Order Themes	Representative Quotes
	Inhibitors / Barriers to understanding design • Foreign concept • Novelty • Ambiguity • Preciousness • Process at odds with urgency of the context	<i>"Sometimes some of the design language can sound very pretentious.... You have to be I think very careful about not alienating people." Polio Lead</i> <i>"As the Lead Manager I am trying to develop a culture of how design is important for UNICEF... how it is impactful" Design Lead</i> <i>"Just the perception of what design really is and what it can offer, I think that there still is a disconnect." Academic Partnerships Lead</i> <i>"That we be not as people who are being introduced at the end of the process, but really being integral of the whole brainstorm as well as development process—it's my hope." Designer</i> <i>"I think people are still sort of just starting to wrap their head around it." Polio Lead</i> <i>"I think there is more that we could be doing to guide our colleagues through that approach [design] because unless you've done it, it has a tendency to sound a little more ambiguous." Innovation Lead Academic Partnerships</i> <i>"We have to continuously produce these things in a short amount of time with no proper study, bypassing the formal design process," Designer</i> <i>"It does take a bit to orient them [professional designers], to kind of switch their minds before they can do the task that's given to them" Lead Design</i> <i>"I always have talked about it [design] in another types of language." Polio Lead</i>

III. Design Manifested in the Unit: Macro Level Institutional Themes

This final subsection of findings is related to the second research question of the study, which seeks to relate the manifestation of salient design attitude dimensions and practices to the processes of innovation underway at the organizational level of UNICEF. Hence this subsection zooms out from the particulars of the phenomena encountered about design attitude in the empirical data to focus on two recurrent themes that emerged from this study with unequivocal strength: accountability and urgency. I examine how these themes play out in the context of the innovation mandate of UNICEF as important forces at the macro-organizational level of analysis that inform our understanding of design attitude manifestations and practices in this organization with new insights that help us get to a more comprehensive view. I illustrate these themes in more detail below. These findings allow for cross-level analysis that show the links between the actions of our informants as individuals and macro-level organizational outcomes—a topic of continued relevance for organizational practice (Thornton & Ocasio, 2008).

Accountability

It should come as no surprise that an important insight from this study—one that cannot be overstated—is that the stakes are incredibly high for innovation when you are operating under the premise of safeguarding the global welfare of the most vulnerable children as UNICEF does. In our interactions with informants, the theme of accountability was inherently connected to discussions about innovation and the implications of risk-taking in a complex and fast-changing world environment, and came up in two distinct ways in our interviews. First, and in general terms, several informants discussed accountability as tied to the question of protecting the prestige of the

organizational identity and brand of the organization: “*we have this beautiful brand with this incredible history that mandates one of a kind of extraordinary people who want to work here.*” And another perspective: “*the risk awareness [we have] could be a risk aversion because there are real reputational risks.... We have a top brand recognition, we have a reputation to maintain and we have civil society on our backs.*” This last statement also connects accountability to the public nature of UNICEF as an organization in terms of its governance structure and funding sources. As one informant further explained in commenting about a proclivity to dwell on institutional narratives that rely on indicators that measure accomplishments: “*we are not really good or do not like to tell bad stories.... How do you explain to a donor what we’ve done with this [if you failed]?*”

Secondly, the theme of accountability took on a heightened meaning for those informants who illustrated humanitarian missions and situation of crisis-response that the organization routinely addresses, whether they are natural or man-made disasters for example. Here, our interviews with the innovation and policy division heads of humanitarian response in the organization were particularly insightful as the following statement by one of them captures: “*Things happen in a very speeded up kind of time scale. We don’t have the luxury you know to fail fast like in typical innovation situations.... In emergencies or humanitarian situations we report on our work in terms of beneficiaries and lives saved.*” The deputy to the Executive Director voiced a similar concern when discussing strategies for risk assessment and preparedness and the acceptance of failure in routine development innovation situations versus humanitarian or emergency response: “*The basic calculations are the same but the kind of risk factors*

that you plug in are different because the impact of failure in an emergency context can be much, much higher and it can result in children dying.”

Urgency

From field data analyses, I identify three distinct motivations that are associated with the theme of urgency as it relates to the innovation mandate and design attitude manifestations. The first impetus is connected to the notion of *legitimacy* and is directly pertinent to design’s role in the work of the Innovation unit within the larger organizational context of UNICEF and the UN. Here we define legitimacy as the generalized perception or assumption that the organizational entity of the unit is desirable and appropriate within the norms, values and beliefs of the organizational culture of UNICEF (Suchman, 1995). The imperative becomes one of ascertaining legitimacy by demonstrating and/or showing the value of this new way of taking action and initiative. As one informant outside the unit shared: *“there is a lot of attention on innovation within the UN and so there’s urgency to show results. The new urgency is, okay we know we have some sound ideas, we know we are doing some good work in a lot of different areas but now I need to demonstrate that more concretely.”*

The second motivation is associated with relevance: the need to change “business as usual” practices and act swiftly because there is a necessary requirement for the organization to remain effective in a rapidly changing world order defined by ubiquitous connectivity and an information technology revolution. Several of our informants in senior positions in the organizations voiced this perspective: *“we have to be doing it differently. We have to do it better, faster, easier, safer... we want to make our organization much more effective ... for us to be able to do it we require to change.”* The

strategic lead for HR echoed this view: *“the world is moving increasingly faster. The ability to be agile and to be flexible, much more than we are, is going to be a survival, a critical success factor for us in the future.”* And, as Dr. Sharad Sapra, the head of UNICEF’s Global Innovation Center in Nairobi shared repeatedly in his interview: *“our assumptions of what we can do have changed, therefore our strategies need to change.”* A similar statement is voiced by Anthony Lake in his speech to the Executive Board of the organization in February 2015 when he invokes the necessity for a mandate of innovation for the organization in the following global context: *“yesterday’s ‘top-down’ world has turned on its side, replaced by today’s ‘horizontal’ world’.”*

Finally, the third motivation seems predicated by the humanitarian mission of the organization itself, an unavoidable sense that time is in fact running out and that large societal forces and institutional logics are exerting incredible pressure to keep enhancing performance and that innovation has a unique catalytic role to play in this equation. As one of the Innovation Co-Leads illustrates: *“we got to go faster because problems are not getting smaller, they’re not getting easier to solve ... The kind of problems UNICEF can address in this network we are building, we can work to solve. We can be bigger that those problems. But we have to be much faster than we are right now and so that’s what keeps me up at night. I want to go faster.”*

Escalating Stakes for Design

The dynamics of accountability and heightened urgency that play out in the complex organizational context of UNICEF as illustrated by our field data represent significant macro-level factors that are interrelated and help explain in part many of the actions of our informants at the individual level of analysis. The following testament by

lead designer Mari Nakano from the Visual Strategy team (in correspondence with the author, December 2014) exemplifies the fluidity and contrarities that are at stake for the identity of design—its unique value and meaning—in this organizational context as it plays against the institutional logics of the organization. It also clearly points to the limitations of the old center of design competencies (as a toolbox of methods) as we may know them, and instead calls for design as a way of thinking and acting collaboratively that may lead to a new sense of collective agency:

“Never does a day go by where my understanding of design is not challenged and where sometimes what you traditionally learn as a designer gets thrown out the door. This isn't a place where you have the luxury to do a ton of processes work. You have to think quick, be malleable to sudden changes, be ready to switch gears and work on a whole new set of asks and not get flustered through it all. You need to be a smart designer here-- one who is articulate, who can speak, who can write, who can maneuver himself or herself through the system. You have to also know that "design" and "innovation" is defined very differently depending on who you speak to so you have to be ready to explain what you do and how you are beneficial to the overall cause. What makes you more than just someone who can spruce up a brochure? Being a critical thinker and knowing about UNICEF's issues, the politics, the limitations of a country, the vast differences between one culture to the next, etc. is all part of the job.”

Design Attitude Manifestations at UNICEF: Towards an Emergent Picture of the Whole

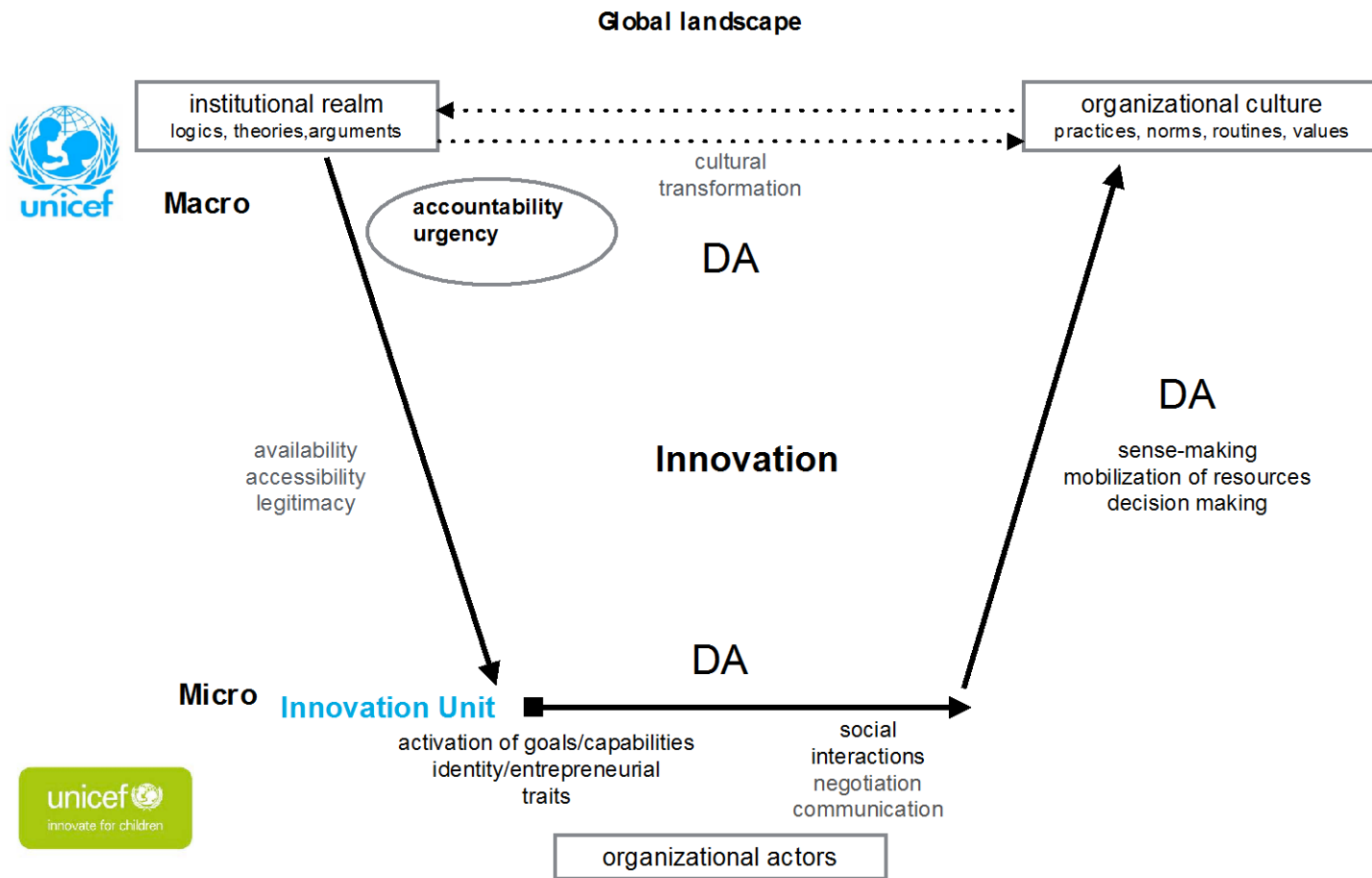
A summation of the findings from my analysis point to a dynamic set of engagements and levels of impact of design attitude that allow us to see with more clarity how design attitude functions and engages in the context of other dynamics where organizational actors make meaning, communicate and negotiate through social interactions which in turn lead to decision-making and changes that impact organizational culture and eventually organizational transformation. In this subsection I briefly explain

these dynamic and cross-level relationships that occur between organizational actors of the Innovation Unit and the macro level institutional logics of the organization as illustrated in Figure 15, which is a process model adopted from the cross-level process models of institutional logics that account for micro-macro and macro-micro dynamics of Patricia Thornton (Thornton et al., 2012) and from the “bucket model” proposed by Anderson et al. (Anderson et al., 2006) which clarifies how much implicit mechanisms in organizations can explain the effects of organizational socialization practices and individual actions. In particular, the latter authors highlight how the relationships, connections and interdependencies of phenomena can translate from agency at the micro level impacting institutional logics at the macro level, and vice-versa through a dynamic constructivist process of agency (at the individual micro level) and structure (at the macro level). I build on these two models to synthesize my observations of design attitude manifestations in this ethnography. The process model that I offer is important in that it attempts to provide a bigger picture of design attitude manifestations in action, abstracting these in a whole image of sorts of the organization. The model should be read from the left bottom point of the bucket (UNICEF Innovation Unit) and upward in a circular fashion counter-clockwise that brings us back to the starting point. It depicts at the micro level organizational actors and members of the unit where I encountered in my observations and from the data of this field study, design attitude capabilities, entrepreneurial traits and evidence of communication, negotiation and social interactions in which design attitude manifested. The model also signals how design attitude was present in singular situations of decision-making and mobilization of resources that impacted organizational actors beyond the micro level (i.e. the deployment of the

RapidPro project was a case in point). At the macro level of the model, I illustrate how design attitude starts impacting dynamic processes of cultural transformation and institutional arguments in which I found again evidence of the importance of embracing many of the dimensions of design attitude (e.g. embracing failure while accounting for the institutional logic of accountability to respond to the urgency of changing development practices). It is important to remark that design attitude cannot be claimed to be fully integrated at the macro-level of the organization (as many of the interviewees shared the struggles and tensions, and the process of becoming that they seem to be engaged in as they strive for change and further agency). Finally, the model shows how both the organizational cultural norms of UNICEF, and the institutional logics of the organization which are further defined by a global landscape in flux, determine institutional logics of accountability and urgency which were the most salient in the findings of this study, and how these become “available” and accessible to organizational actors as information that both conditions their goals and interactions, at times constraining agency and at others enabling it, all in a dynamic process.

Figure 15: Model of Innovation Dynamics and Design Attitude at UNICEF

Design Attitude (DA) in the Organizational Context of UNICEF



Discussion

Being afforded the opportunity of examining up close organizational life within the Innovation Unit at UNICEF to probe how design attitude manifested in the unit and throughout the organization was a great privilege. As it can happen in ethnographic engagements, there were many instances throughout the process of observation and fieldwork in which I was almost too deeply and emotionally invested with the developments at hand, and would have to catch myself recalibrating in order to regain the necessary distance for analysis (Sanday, 1979). I recognize however that negotiating this precarious balance between the cognitive and the affective, the planned and the serendipitous events that influenced my research (e.g. the Ebola emergency outbreak during the RapidPro platform development was a very powerful example of a unforeseen event that occurred during this period) brought vitality and additional analytical insights to this inquiry (Barley, 1990).

With this field study, I set out to explore two interrelated research questions. I first probed how design attitude and its dimensions manifest within projects undertaken by the UNICEF Innovation unit and the organization at large. Secondly, I examined how the manifestation of these salient dimensions and practices relate to the processes of innovation underway in the organization overall. The perspectives I offer have implications for theory and practice.

From a theoretical perspective, this study fills a critical gap in the institutional entrepreneurship literature (Battilana & Dorado, 2010; Jones & Livne-Tarandach, 2008; Suddaby & Greenwood, 2005; Zilber, 2006), which has not, to the best of our knowledge, included any comparable empirical study that includes an examination of design in the

context of organizational change in an international organization of the scale of UNICEF. In this regard, this study provides a foundational example that future research may be able to build on and further validate. This study also extends insights from a contemporary body of literature that focuses on the intersection of design and innovation in organizations, and specifically builds on the relatively recent research on design attitude (Boland & Collopy, 2004; Michlewski, 2008, 2015) by demonstrating with new empirical evidence the singular agency of design attitude approaches to advancing problem-solving and systematically exploiting innovative opportunities for change and collective action. A significant contribution of this study is that it offers an in-depth examination of design attitude capabilities and values functioning in action, but this time in the organizational context of UNICEF, which represents an extreme case of an organization that is addressing deeply complex societal inequities and contending with shifts in institutional logics that are associated with perhaps some of the most profound political, economic, social and technological transformations of a “post-post crisis” twenty-first century world (The World Economic Forum, 2015), one defined more than anything by disruption and change. In this fluid context of high stakes, the field data of this study points to the themes of accountability and urgency as important macro-level concepts that inform in consequential ways how design attitude and the emergent mode of design practices that manifest are carried out at UNICEF as innovation initiatives take shape.

In particular, my examination of the design attitude dimensions identified in the literature and that I further operationalized in my prior research in chapter 2, sought to directly assess how three key dimensions that I suspected would be particularly

significant in accounting for innovation processes—ambiguity tolerance, connecting multiple perspectives and empathy—would perform in the organizational context of UNICEF. The field data I collected confirmed this proposition. The design approaches to problem-solving and mediating complexity that designers typically follow by establishing a connective tissue of sorts between issues across situations of complexity, their performing effectively under important constraints and circumstances of great uncertainty, and their deeply sensitive and empathic concern for human challenges, were all indeed significant abilities and valued contributions—ones recognized within and outside the organizational context of the Innovation unit. In this sense, this research deepens our understanding of key enablers that account for this phenomena, and extends theoretical insights by pointing to these three dimensions of design attitude as important “wins” for design’s agency in organizational practice. I found instead that the dimensions of creativity and aesthetics were more polarizing in this organizational context and had a tendency to often be at the source of tensions. This conclusion does not come as a surprise as it mostly corroborates contemporary theoretical and empirical insights that have been debated in the field of organizational aesthetics for example (Stephens, 2015; Stephens & Boland, 2014; Strati, 1992; Taylor, 2005; Taylor, 2012). A future study however could investigate in more depth the aesthetic dimension of design attitude and probe as other studies have (Stephens & Boland, 2014) how aesthetic knowledge in the organizational context of UNICEF results or not, in a driver of problem-solving and innovation.

Additionally, because I started my inquiry with an in-depth examination of the unique structural make-up and programmatic foci of the Innovation Unit and its

characteristics, in order to gradually build my understanding of design attitude manifestations that could be situated within this context, this case study highlights the important integration of design within an organizational culture that promotes entrepreneurship, which is the case of the Innovation Unit. My field data points to the overlaps of entrepreneurial traits of the unit (i.e., agility, experimentation, risk tolerance, acceptance of failure, bottom-up strategies for innovation and an overall positive orientation towards change) with commonly associated design methods and practices. Hence, the Unit and its actors—including the designers that are embedded in the unit—can be viewed as a locus for *institutional entrepreneurship* within UNICEF as a whole since there is evidence not only of a constant concern to leverage resources to transform existing conditions in the institution to create new change (Maguire & Hardy, 2006) against forms of bureaucratic inertia or stasis, but also an aptitude to take a reflective position towards institutionalized practices and envision alternatives modes or futures to get things done to innovate—an orientation towards learning and change closely aligned both with the agency of entrepreneurship (Beckert, 1999) and design (Schön, 1983; Simon, 1969). My observations, interviews, and analyses illustrate how socially skilled the Innovation unit team would be, time and again, in effectively developing rhetorical narratives and arguments that referred to the already established institutional logics of UNICEF. Their adroit integration of design framed in a motivational way change projects in the organization, forwarding their vision for innovation initiatives and advancing an agenda of action (Battilana et al., 2009; Maguire & Hardy, 2006).²⁶ An important

²⁶ This entrepreneurial process especially stood out during this ethnography from the first-hand observations I made during the several months in which I participated in the shadowing of the design and development of the RapidPro technology platform. This flagship initiative of the unit necessitated an

question that this study does not address is whether the effectiveness of design attitude that we found in the processes of innovation at UNICEF would be as true were this capability not embedded with the unit, but elsewhere, in a less entrepreneurial subculture of the organization.

The pursuit of significance and approximation to knowledge—“the means by which to speculate about contraries without knowledge of essence” (Richard McKeon quoting Aristotle in his essay on “Dialectic and Political Thought and Action,” 1954) was an important higher-level aim of this inquiry. By dwelling in the “productive ambiguity” that the qualitative methods deployed in this investigation afforded me, I pursued “a dialectic of suspension of judgment and probability” (McKeon, 1954), a strategy for analysis through asking questions, and framing and reframing insights that also comes close to the liquid and open exploratory research and design practice methods (Boland et al., 2008) that many “designerly ways of knowing” (Cross, 2006) celebrate as well. Given the nature of the study and the dialectical progression of my inquiry in the dissertation, the opportunity to observe first hand how design attitude manifests in the larger context of UNICEF was fundamental as it provided a set of circumstances for research where I was able to step back beyond the significance of the particulars of the perspectives I had gained about design attitude and its dimensions as relevant to the work of individual designers and teams (in chapter 1) or as connected to its impact on projects (chapter 2) and instead gain a perspective of some of the whole: the interdependencies

important buy-in across the organization and globally (the latter included the cooperation of several country offices), in order to launch as successfully as it did within a relatively accelerated timeline, and against unforeseen circumstances that added pressure to the delivery of the platform (i.e. the Ebola public health crisis in summer 2014); the process of its development made explicit the institutional entrepreneurship of the unit and the effective integration of design in its make-up.

related to design attitude manifestations in the organizational context. In other words, my position as researcher embedded in the contextual sphere of this particular study illuminated the extent to which design attitude is made explicit in the organization, and where it is not. The study also revealed mechanisms at the macro level of the organization that show how design attitude can be transformational when it occurs at the micro level and impacts the macro level (e.g. the actions of the Innovation unit for example in developing the RapidPro project and managing its successful deployment during a moment of crisis amid the Ebola epidemic of the RapidPro platform is a case of this) or simply situational, in which design attitude was a driver of action formation initiatives that would or not necessarily advance beyond a level of communication and social interaction within the Innovation Unit itself or discreet organizational actors in other divisions of the organization (e.g. the data points to many examples where this was the case, with informants claiming to translate actions into very concrete initiatives demonstrative of impact). In reflecting on the richness of the findings from this study that I captured (and many more that remain to be articulated in a future article), I cannot over-estimate how this ethnography in many ways acted as fundamentally elucidatory because it revealed design attitude manifestations at different levels of the organization. As Anderson et al. (2006) have discussed in their research about the implicit mechanisms that articulate the linkages from macro to micro dynamics in organizations, the process of this ethnography about design attitude in the context of the Innovation mandate of UNICEF was for me as they cite truly explanatory in the Latin etymology sense of the word: *explanare*, meaning to “to take out the folds”.

Finally, given the multi-contextual level of analysis of this ethnography, this inquiry contributes to our understanding of design attitude manifestations as part of current theoretical frameworks that examine dialectical processes of institutional change (Benson, 1977; Carlo, Lyytinen, & Boland, 2012; Seo & Creed, 2002). The field data of this study highlights the often paradoxical arrangements and interrelationships that occur between an aspiration for transformational agency via the actions (particulars) that many of the members of the Unit take to advance innovation, versus a complex set of institutional arrangements (wholes) that are governed by bigger contextual changes and institutional arrangements. In this regard, the macro-themes of accountability and urgency that emerged from our analyses represent important drivers that account for how design attitude manifestations that impact innovation take place beyond the project level, and vis-à-vis institutional logics that underpin UNICEF's mandate to deliver on the global welfare of children.

Furthermore, this study has important implications for managerial practice by highlighting not only the contributions of design attitude to the innovation mandate of UNICEF but also in clarifying some of the barriers or inhibitors it encounters at the organizational level. This research shows a great variation in the perception of the strategic intent and capability of design within the organizational context of UNICEF: from it being central to actionable strategy for the organization in its pursuit of the innovation agenda, to remaining at the periphery as a means for communication and discreet interventions. While one must proceed with caution in generalizing from one study, this research does demonstrate that as organizations tackle increased complexity, the potential for design to contribute at the strategic end of the spectrum seems more

critical than ever. Insights that bring further clarity as the one that emerge from this inquiry to what constitutes the wins and inhibitors that may lead to successful outcomes of design in organizational practice will hopefully help designers and managers alike advocate with more discipline and conviction for the place of design in strategy, thought, and action.

Limitations

My goal in this study has been to construct an authentic narrative, striving for transparency in terms of the logic that underlines the interpretation of the data collected so as to reveal with coherence and veracity new insights about the manifestations of design attitude within the innovation practices that occur in the organizational context of UNICEF and against institutional logics governed by the notions of accountability and urgency. While key aspects of these findings may be generalizable and contribute to advancing our understanding of the drivers that enable or inhibit the collective agency of design attitude at a macro-level of organizational analysis, the theoretical contributions that I present are inherently limited in their inter-reliability and replicability by the nature and methods of this inquiry—an ethnography. As Michael Pratt reminds us, part of doing ethnography is gaining deep experiences about the phenomena observed over an extended period of time, which inevitably results in rich descriptions and views that have an important dose of idiosyncrasy (Pratt, 2009). The validity of the inferences based on my coding of the data and the findings I put forward are thus clearly intertwined with my unique lens as a researcher and the position I took in the field. From a content perspective, a second limitation of this study is centered on the fact that I have not chosen to conduct a more extensive literature review, specifically on institutional

entrepreneurship, to investigate what additional evidence there may be of embedding design attitude in innovation practices in other organizational contexts that similarly do not espouse an overall design-fluent culture; this might be a direction for further research in a future study.

Conclusion

The act of clarifying true problems opens up new grounds for inquiry and action (McKeon, 1964) as the analysis of past and present practices can help us commit to future possibilities (Clifford & Marcus, 1986). This ethnographic case study sheds light on how design attitude and design principles intersect with the evolving innovation practices of UNICEF, both confirming design's collective agency in social processes of reconstruction and innovation, as well as its limitations. In this sense, the research that I conducted provides a new theoretical basis for exploring how design attitude manifestations interact with processes of innovation at the organizational level that I hope will stimulate a more nuanced appreciation of the value of design and designers to organizational practice and generate new grounds for insights and action.

CHAPTER 4: SIGNIFICANCE OF THE INQUIRY

“To be a human being is to be an individual existing in coherent relationship with one’s cultural context and the diversity of other human beings. To be is to be one and many.”

— Richard Buchanan, *The Ecology of Culture, Pluralism and Circumstantial Metaphysics*, 2000.

The Integrated Findings: Why they Matter

Richard McKeon reminds us: “problems are encountered and considered only if problem-solving is joined to problem discovery” (Buchanan, 2000). My research has been oriented towards that goal of problem discovery by attempting to elucidate the value of design attitude for social innovation where the pluralism of design attitude approaches and practices of design presented in chapters 1, 2, and 3, are defined by unbounded conditions and complexity. Collectively, and through the sequence of perspectives that they offer, these three empirical studies of the dissertation reveal with disciplined coherence and powerful new evidence a set of principles and capabilities that further clarify the significance of design attitude for social innovation.

In this subsection I summarize the salient findings from the three empirical studies. I then discuss the significance of the research insights: first, the contributions it makes from a theoretical perspective in mapping what I call the “return on design,” and secondly I reflect on the implications of the research contributions for design practice.

Key Findings of Chapter 1: Design for Social Change: Consequential Shifts in the Designer's Role

Inquiry is an activity of invention that begins in uncertainty, perplexity and doubt (Buchanan, 2000). This was my point of departure when I engaged in the initial qualitative study of this dissertation. My analyses of the rich data set from the four case studies, in which I had many conversations with designers and their collaborators and clients focused on projects with a social innovation aim, eventually yielded four key findings that in summation led to the core insight of the dissertation's inquiry overall: **the central concern of demonstrating the value of design in the context of social innovation.** Specifically, the four findings leading up to this conclusion were the following:

- 1) **The practices that designers are engaged in represent what I qualify as an “uncharted territory.”** Individuals are engaging in projects where their roles often require expansion of skillsets and re-definition; the focus of the design brief is often unknown, and “what success looks like” can represent a challenge to both the designers and their clients/partners as they address societal challenges that are fluid and multi-faceted, and where it is often difficult to isolate where to intervene from a design perspective alone.
- 2) **The shifting identities in the roles of the designers in these practices are a source of tension and represent a complex set of challenges and limitations:** the extent to which the value of their unique capabilities and contributions are ambiguous can represent profound unease and sometimes conflict for the designers and their clients alike. These practices are

fundamentally un-codified practices. The context of uncertainty that can surrounds this work can have unfortunate ramifications: it may result in lack of sustainable funding streams that support designers to do these projects at times, and at others, in the lack of full integration of design capabilities in a strategic manner in organizations.

3) Design is celebrated for its capacity to innovate. The capabilities and creative approaches of designers to tolerate risk in the complex and uncertain circumstances that characterize social innovation projects, and successfully advance innovation outcomes working to mediate and negotiate a diverse of viewpoints, are generally valued as a unique strength.

4) A pluralism of methods and practices populate the space of design for social innovation. I found considerable variance in the approaches to social innovation that these design teams had, which in my view is indicative of the richness and diversity of contributions in this emergent mode of design engagement that remain to be harnessed fully.

Key Findings of Chapter 2: Explaining the Effects of Design Attitude on Team Learning, Process Satisfaction and Social Innovation Outcomes

The two most significant contributions of this quantitative study to design for social innovation and management theory and research may be: firstly, putting forth new psychometric scales that are consistent with prior theoretical and empirical research, and operationalizing design attitude as an aggregate or formative second-order multidimensional construct (Law et al., 1998), and secondly, establishing the content, nomological and predictive validity of design attitude and thereby providing novel

insights into design behaviors that influence social innovation processes in what remains an emergent field for design--where the value designers bring is yet to be fully understood and where there is considerable absence of foundational metrics, which this empirical study is one of the first to offer.

The principal findings of this study can be briefly summarized as follows (please refer to chapter 2 for a comprehensive report on the findings):

1) The measurement model put forth supported each design attitude

hypotheses. I found evidence of significant positive relationships between design attitude and social innovation project outcomes ($\beta = 0.950, p < 0.001$), between design attitude and team learning ($\beta = 0.396, p < 0.001$), and between design attitude and process satisfaction ($\beta = 0.288, p < 0.001$).

2) The study confirmed the positive significant relationship of user

participation with the three dependent variables in the model (social innovation project outcomes, team learning and process satisfaction). This finding extends evidence of the importance of user participation in design for social innovation practices that benefit from processes of co-creation (Ehn, 2008; Sanders & Stappers, 2008). By adapting the information systems scale of Hartwick and Barki (Barki & Hartwick, 1994; Hartwick & Barki, 2001) this study operationalizes the significance of user participation as a whole for design.

3) Visualization and Prototyping: the study shows more limitations with regard

to these constructs' impact in social innovation projects. This is a rather counter-intuitive finding that may be explained by confounding dimensions in the model in the case of visualization; for prototyping I found negative effects. I

theorize that this effect may be due to the fact that prototyping acts as an “anchoring” concept, i.e. because the process of prototyping may give form to a given anticipated solution in a process of innovation, it may actually halt exploration and cut short alternative possibilities.

Key Findings of Chapter 3: Innovation by Design at UNICEF: An Ethnographic Case Study

My choice to conduct an ethnographic study with the Innovation Unit at UNICEF to probe manifestations of design attitude at the organizational level required my immersion in the field with the objective as Mintzberg states: “to get close as close to phenomena as possible in order to dig out the inputs (data, stories, and lots more) but then be able to step back to make something interesting out of them”(Mintzberg, 2005: 365). The process of making sense of the very rich dataset that I assembled to organize findings and keep the focus of my theorizing within the boundaries of inquiry was at times challenging. Amidst this richness of data and sense making, the findings of this empirical study can be summarized as follows:

- 1) **The study offers a “thick description” of the Innovation Unit as ground zero for innovation in the organization.** It was important for me to understand in depth the organizational context of the unit to learn how design attitude capabilities aligned or not with the principles, practices and the composition of organizational actors that formed the unit. The picture that emerged from these analyses is one that points to the unit as a highly entrepreneurial division that integrates design strategically

and has unique agency within the organization (given its reporting structure, leadership and other factors).

- 2) **Multilevel and multi-contextual insights about the confluence of innovation and design in the organization.** My strategy of directly probing in my interviews, field observations and data analyses what dimensions of design attitude manifested in the Unit and the organization at large, allowed me to gradually get to a deeper understanding of where design attitude approaches and innovation objectives meet in the organization. I was able to detect patterns that allowed me to see key enablers and barriers or inhibitors to design attitude capabilities as these manifested in key initiatives and projects of the unit, where championed by organizational actors at the micro level, and then moved through the different levels of decision-making and negotiation in the organization. Importantly, the dimensions of design attitude that emerged from the second empirical study as particularly strong in EFA analysis (ambiguity tolerance, empathy and connecting multiple perspectives) were also by far the dimensions of design attitude that represent what I call the “wins” of design in advancing innovation in the organization.
- 3) **Limitations of design attitude’s agency against institutional logics.** A core finding of this study is centered in putting into perspective design attitude’s agency within the macro level framework of the organization. In the context of the global mandate of UNICEF, the norms and values that the organization has at a macro level, as well as the urgency and

accountability along with the need for legitimacy and delivery of programming to meet the welfare of children around the world are important forces that sometimes constrain design attitude's agency.

Theoretical Implications

The central argument that I put forth in this dissertation is that by elucidating the unique value that designers bring to the emergent field of social innovation, we may also gain new insights into the design discipline as a strategic organizational capability and as the source of momentous potential for human progress. This dissertation confirms this hypothesis, as the insights that I cull from the three empirical studies in the dissertation contain significant meta-inferences about design as an intellectual and practical art (Buchanan, 2001b) capable of informing and enriching designers and managers who are confronted with issues of cause and action that matter deeply not only to the field of social innovation, but also to current organizational practice overall. The theoretical approach and empirical findings from this inquiry offer three main contributions to contemporary design and management research that I present below.

The first contribution is a theoretical extension of the design attitude construct:

As I discussed in chapter 2, by operationalizing the first-order dimensions of design attitude and measuring relationships between design attitude and complementary constructs in the design domain (prototyping, visualization and user participation) within a rigorously designed quantitative framework that tests the connections between these factors and processes of satisfaction, team learning and social innovation project outcomes for the population of interest (a predominantly design and design-fluent

audience), I arrive at findings that demonstrate in no uncertain terms the significant value teams that espouse a design attitude (and embrace its five characteristic multifaceted dimensions of creativity, connecting multiple perspectives, empathy, ambiguity tolerance, and engaging in aesthetics) have in the social innovation context, presenting a set of foundational metrics that ultimately explain with new evidence the impact of design attitude on social innovation. In addition to presenting new scales for design attitude that future research studies may be able to further validate in contexts outside social innovation, and with new populations of interest, this dissertation also extends theory on design attitude with an in-depth organizational ethnography—that of the Innovation Unit at UNICEF (chapter 3). This study represents the first ethnography, to my knowledge, that systematically integrates and probes design attitude as a multidimensional construct in an organizational context. The insights reveal new micro to macro, and macro to micro level dynamics between organizational actors and institutional logics. While not necessarily generalizable across all organizational contexts, these findings do help explain in part how the agency of design attitude functions in the organizational context of UNICEF, and in this regard offers interesting directions for future study.

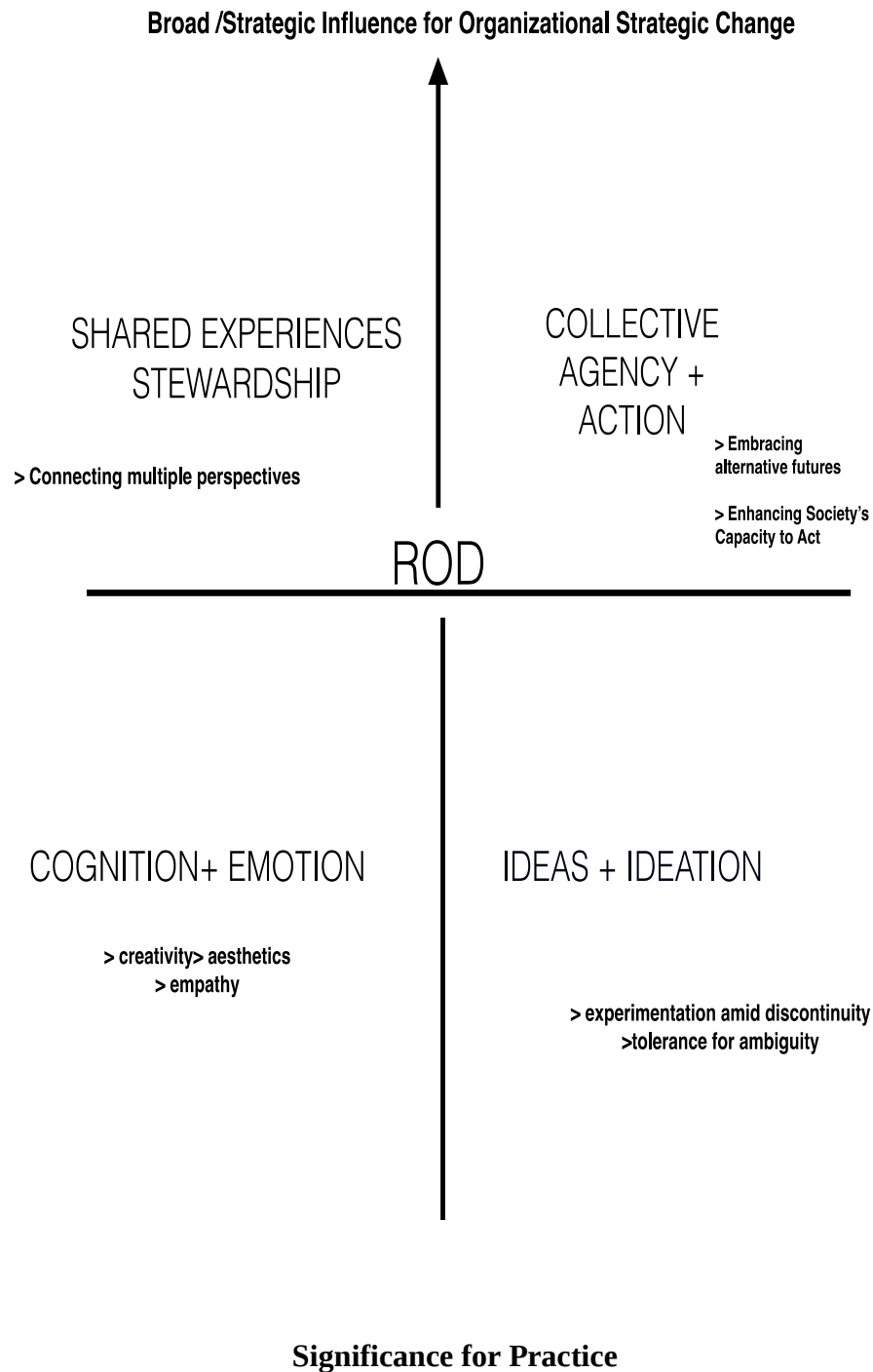
The second contribution of significance that emanates from the cumulative findings of the three empirical studies is a broad conceptualization of design that reaffirms the discipline's deeply human-centered agency within the pluralistic diversity that characterizes our organizations and institutions today. The two qualitative studies of the dissertation in particular confirm recent theoretical streams in the design and management literatures that have signaled this capability of design for some time. The substantive empirical evidence that this dissertation provides may infuse those bodies of

literature with novel and nuanced insights that could help bring new clarity to the arguments put forth in those studies.

The third and final contribution of this inquiry resides, I would argue, in its powerful illustration of the values and principles of “fourth order” modes of design in action, to use Richard Buchanan’s classification. There are many insights in this research that reveal how designers excel at making ideas concrete, how they delight in wonder and surprise, and are perfectly at ease at embracing the essential conditions of ambiguity and improvisation that characterize social innovation processes and the fluid demands of the organizational environments that they inhabit—ones which increasingly must integrate different forms of knowledge to enhance society’s capacity to act. There is also evidence, however, of designers’ significant contributions in advancing far less tangible challenges within the networked and systemic nature of many of the projects and organizational priorities that I studied and observed firsthand. It is from this place of collective human agency that the “return of design” comes into clearer view.

Figure 16 represents a conceptual map that depicts the antecedents or key dimensions that encapsulate pathways towards the return of design (ROD). The matrix captures the capabilities of design attitude in the context of a progression from ideas to action, and from the individual approaches to innovation of designers in the lower quadrants of the matrix to collective agency and action that may lead to broad organizational change and the multifaceted value or “return” of design.

Figure 16: The Return on Design (ROD): Towards a Matrix



As practitioners and managers in many disciplines look to design as a new field of influence to spark creativity and accelerate innovation efforts toward societal progress in

our organizations and institutions, this dissertation presents a number of concrete findings that may guide them: both in recognizing and more confidently integrating design attitude capabilities more strategically, as well as committing the necessary resources to shape change and maximize impact.

First of all, and as it relates to the problem that this inquiry takes on—elucidating the value designers bring to the emergent field of social innovation—the results from the three empirical studies confirm the important collective agency of design as a discipline. The research sheds light on the salient abilities that professional designers exhibit in addressing fluid and complex societal challenges, acting as a “connective tissue” of sorts in interdisciplinary teams and organizational contexts marked by discontinuity, where they can serve as effective mediators. While the studies I conducted confirm that well-established techniques and the toolbox of design thinking practices for problem solving are useful, many of the insights also suggest that these methods and techniques have limitations and, furthermore, in some circumstances and organizational contexts they may prove to be counterproductive—as they become associated with a manifestation of design that can be viewed as too precious, or as a commodity that is “nice to have” versus one that is needed for social impact. Importantly for practitioners, there is ample evidence in the three empirical studies of this dissertation that demonstrates that designers have unique abilities that do not constitute a “bag of tricks.” While many of the holistic traits of a design attitude may be nuanced and neither clearly visible nor easy to identify, they are associated with the professional culture of design; the empirical studies in this dissertation show how instrumental they can be in accounting for solutions and achieving breakthroughs in thinking and action.

In this regard, a particularly significant and tangible contribution of this research is the design attitude scale that I validated in the quantitative empirical study. This instrument represents an important tool moving forward for practitioners to use and validate in new contexts as they develop protocols for evaluation and assessment of design-led components in social innovation projects and initiatives. I believe that this rigorously validated instrument that operationalizes design attitude, and also accounts for the impact of typical design techniques and practices on social innovation, has the potential to be an actionable and useful tool as practitioners in the field continue wrestling with how to better utilize the capabilities of design—ones that are typically very difficult to measure. The insights I have culled from my research over the past four years and many conversations with the leading practitioners who have participated in these studies has only reaffirmed my sense of how critical it will be to integrate rigorous metrics to contemporary practices of design for social innovation in order for the field to continue moving forward. This research has aspired, and I would venture succeeded, in representing a stepping-stone on this front.

Finally, and in general, the findings from this dissertation also illuminate a number of limitations and challenges that the design profession faces, as designers are given and seek opportunities to exert their unique abilities and capabilities in projects that call for expanded roles and responsibilities in the social and public sectors. I consider these limitations not so much insurmountable challenges as much as factors that signal opportunities the profession has to address as the field of design for social innovation continues to mature. More specifically, I would point to several insights that highlight the tensions designers are experiencing as a result of their limited strategic engagement in

some of the organizations or projects they lead. Often, they are absent from the full arc of design and implementation of their projects; other times, they are not full participants of key decision-making processes at the organizational level. Their lack of full knowledge or weigh-in at this more macro level of institutional dynamics is shown to be problematic, and sometimes halt processes of innovation. How to bridge this gap is a subject for further study and assessment by both practitioners and scholars alike.

Limitations

This dissertation has a number of theoretical and methodological limitations despite the strengths of the triangulation of the mixed methods approach pursued and several original insights that emerge from its integrated findings. Regardless of the type or method of inquiry, issues of subjectivity, interpretation, meaning and relationships among phenomena and between researcher and the subject of the research will always matter and influence analyses, and this dissertation is no exception to that rule (Michailova et al., 2014).

First, in the case of the initial qualitative study, my sample was limited to four extreme cases (Yin, 2014) in which designers engage in complex projects with an overreaching social innovation aim where their expertise is deployed among interdisciplinary teams, across a variety of organizational structures. The methodological approach I subscribed to combined grounded theory and case study methodology. Grounded theory assumes an interpretative portrayal of the studied world, not an exact picture of it (Charmaz, 2014). And by its very definition, the tendency of case study methodology is to illuminate concrete problems within a set of phenomena, but it is at its most effective when an intentional strategy directs its logic of design (Yin, 2014). The

semantic framework that I chose to layer over these methods as my analytic lens may have precluded me from interpreting data converging differently, which could well have led to other generalizable insights.

For the second quantitative study, which developed new psychometric scales for design attitude and tested a survey instrument with a population of designers and managers with a high degree of design attitude fluency and expertise in conducting social innovation projects, generalizability of the findings remains a concern given the contextually dependent sample and the instrument being subject to social desirability bias, which is a limitation. While I attempted to capture a relatively wide spectrum of diversity within the population of interest, data availability from my survey was limited to sampling design practitioners, educators, students and project managers who, as already mentioned, all exhibited a rather high degree of design expertise. Additionally, these are individuals who had competency with the typology of social innovation projects that I was interested in probing. Hence, the results I obtained may help understand the designer or project manager who falls within this demographic, but it is not clear that the findings would be generalizable outside this range of individuals in the same way. Furthermore, the scales used in this study, many of which are new, have never been used in this combination, and there are no good tests for validity. Overall, some caution should be acknowledged with regard to measures. Because such a core emphasis of that study and its key contribution was to generate a new scale and validate it by operationalizing the multidimensional construct of design attitude for the first time in the literature, an important path for future research might be to seek to validate the instrument in other professional contexts. Furthermore, the relationships between variables that I put forth in

the measurement model amounted in some cases to results with high explained variance (e.g. the model for social innovation had an $R^2 = 0.834$), which suggests possible construct overload; there was also high correlation in measurement between some variables in the model (i.e. specifically in measuring only designers with high design fluency). These results are a limitation and merit further examination in a future study.

The third empirical study in the dissertation, the UNICEF ethnography, also presents a number of limitations. First of all, my fieldwork studying the manifestations of design attitude occurred in the singular organizational context of the Innovation unit, a context that is contending with the specific institutional logics of UNICEF and its global mandate as a whole. In addition, my purposive sample choices in the qualitative semi-structured interviews conducted and the thematic analyses that I pursued to mobilize meaning and evidence from the findings of this study responded to my particular set of theoretical lenses and biases as a researcher. While I believe that my journey of exploration through deep immersion in the organization and the findings of the study point to a more explicit and nuanced set of explanations about how design attitude functions at a macro organizational level, replication of the findings was thus largely absent as an aim of the inquiry.

CONCLUSION

Demonstrative arguments are based on necessary principles, dialectic on probable; but since few things are known certainly, the science of the probable prepares the way to all knowledge.

— Richard McKeon in *Ethics*, 1954.

With the aspiration for disciplined coherence and clarity, this inquiry has sought to deepen our knowledge of the emergent field of design for social innovation. Drawing from the insights of its three empirical studies, and following a dialectical strategy of inquiry in a continuum of sense making, I argue that there is merit to better understand the agency of design attitude for social innovation. The more lucid picture of the “return on design” for social innovation that emerges from this inquiry is one I hope may contribute to us seeing “more profoundly, imaginatively and unconventionally” the promise of design for organizational practice as a whole. (Mintzberg, 2005)

Appendix A: The design Attitude: Abilities & Capabilities

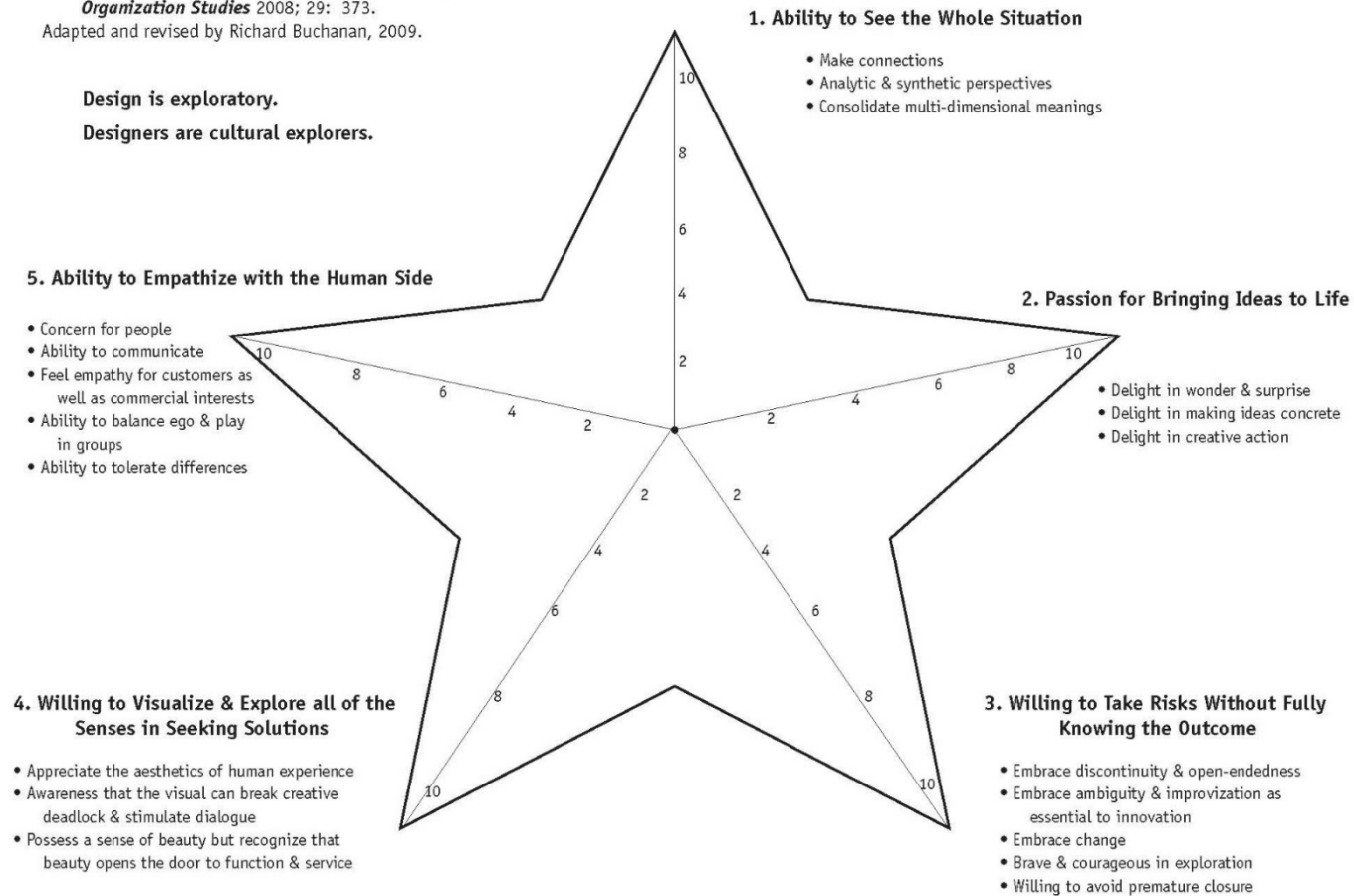
The Design Attitude: Abilities & Capabilities

from Kamil Michlewski, "Uncovering Design Attitude,"
Organization Studies 2008; 29: 373.

Adapted and revised by Richard Buchanan, 2009.

Design is exploratory.

Designers are cultural explorers.



Appendix B: Synopsis of Case Studies

1. CLEAN TEAM



Image Courtesy of Ideo.org

Synopsis: A new sanitation offering in Kumasi, Ghana, that combines product, service and business design. Instead of having to use public latrines, customers receive a toilet in their homes, which is serviced three times a week and allows families to pay on an incremental basis.

Clients	Core Design Team	Stakeholders	Sector
UNILEVER WSUP	IDEO and IDEO.org	Kumasi Municipal Services; Kumasi Families	Sanitation

Case Narrative

Context: Some one billion city dwellers worldwide lack adequate sanitation facilities in their homes. Unilever, a multinational maker of consumer products, and Water & Sanitation for the Urban Poor (WSUP), a nonprofit, tri-sector partnership, were looking for solutions to this problem.

Innovation: Unilever and WSUP asked IDEO and its social innovation arm, IDEO.org to help determine the best approach to develop new products and services for the urban poor. The team chose Kumasi, Ghana, a city of 2.5 million people, as the test market. In

Kumasi, less than 20 percent of the population has access to in-home sanitation. Many people walk long distances to a public toilet, or worse, are forced to use other options such as open defecation if necessary. IDEO.org conducted interviews with families in Kumasi and Accra, Ghana, and researched the global state of sanitation innovation. Based on these findings, they developed a concept for a “high touch service toilet.” The team prototyped various working toilets in Kumasi households, a process that revealed people’s true in-home sanitation needs. IDEO.org designed the basic toilet system and service component, and Unilever and WSUP piloted the project with about 100 families in the city of Kumasi, Ghana. In spring 2012, as part of the second phase of the project, IDEO.org was tasked with building out the brand strategy of the Clean Team toilet service, with the goal of reaching 12,000 households by 2013. IDEO.org designed a Clean Team brand that was seen not just as a sanitation business, but also a social business and a sanitation solution set on redefining the status quo and for scaling the Clean Team toilet service in Kumasi and beyond.

[source: <https://www.ideo.org/projects/clean-team/>]

2. PROJECT MWANA

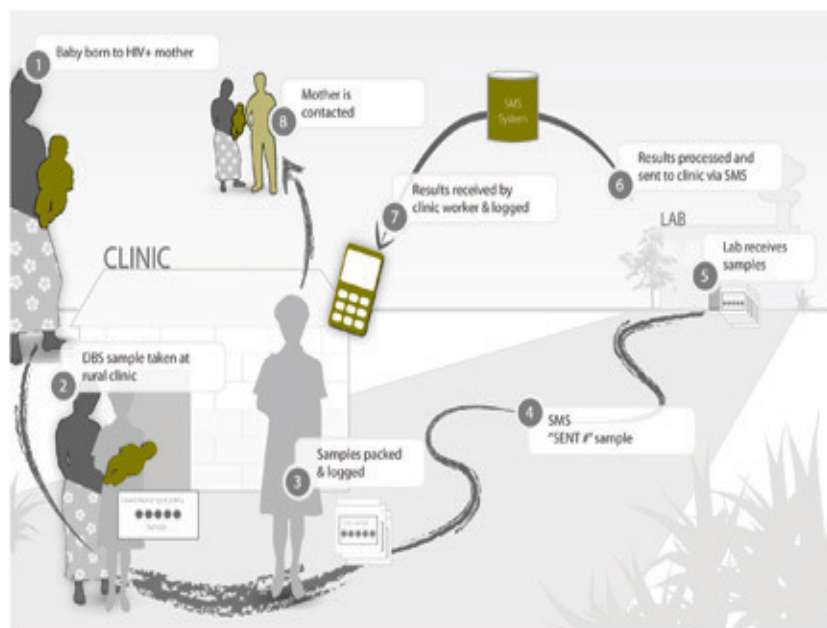


Image Courtesy of UNICEF Tech4Dev

Synopsis: A mobile service that delivers HIV results of infants to rural clinics and a messaging platform to ensure the results are communicated directly to mothers that has reduced the time to deliver critical information from four weeks to minutes and increased post-natal visits since its pilot roll-out in Zambia and Malawi.

Clients	Core Design Team	Stakeholders	Sector
UNICEF Zambia Health Ministry Malawi Health Ministry	Frog Design UNICEF Innovation Unit (Tech4Dev)	Community Health Workers Mothers	mHealth

Case Narrative

Context: Despite major advances in vaccines and treatment, millions of children die from preventable diseases each year. Often the challenge is as much lack of access to information as it is to lack of access to medical supplies. The Health Minister of Zambia asked UNICEF to improve infant diagnosis and treatment in rural areas that sit far outside the reach of traditional healthcare infrastructure.

Innovation: For the Innovation Unit (previously known as UNICEF’s Tech4Dev) team, this was the first opportunity to deliver a program on a national scale that, if successful, could be replicated around the world. UNICEF wanted a design partner to ensure that the solution was tailored to the real needs and expectations of the communities involved and engaged Frog Design to help develop strategies for solving the “last mile in healthcare delivery,” and focus on volunteer Community Health Workers (CHWs) who are the only consistent link in the chain of health services in these deprived rural contexts. Frog Design helped UNICEF create a user-centered system designed for and with CHWs that included key incentives and feedback loops.

[source: <https://www.ideo.org/projects/clean-team/>]

3. BRANCHEKODE.DK

Image Courtesy of Mindlab

Synopsis: A new interactive website and digital portal that allows business owners to identify and register their companies with the appropriate industry codes that the government classifies businesses for statistics, tax and administrative purposes.

Clients	Core Design Team	Stakeholders	Sector
Danish Tax Authority Statistic Denmark Danish Business Authority (DBA)	Mindlab	Danish Business Owners and Citizens	Public Sector Innovation/ Governance

Context: Industry codes are a frequent source of statistical errors, pressure on public sector telephone lines and erroneous company inspections. The Danish Business Authority's development group, Team Effective Regulation (TER), therefore initiated a cross-ministerial project on industry codes led by Mindlab to demonstrate the value of closing the "last mile" separating well-considered regulations from effective use by citizens.

Innovation: The new website design prototyped by Mindlab provides a more flexible search interface, does a better job of explaining things to the user in plain language, gives the user hints on whether the code is right for them, and allows DAB frontline workers to add tags to the database so that the system effectively becomes "self-learning."

[source: <http://www.mind-lab.dk/en/cases/nyt-branchekodesite-hoester-gevinster-baade-hos-myndigheder-og-virksomheder#>]

4. DESIGN EXCHANGE PROGRAM *



Synopsis A pilot program led by Sitra, the Finnish Innovation Fund, focusing on bringing government and design together by embedding designers in strategic government positions for a year.

Clients	Core Design Team	Stakeholders	Sector
City of Lahti Helsinki Department of Social Services Ministry of Employment and the Economy Ministry of the Environment	Helsinki Design Lab Sitra, Finnish Innovation Fund	Finnish Citizens	Public Sector Innovation/ Governance

Context: A strong commitment to innovation and R&D by the public has played a crucial role in Finland's development into one of the leading knowledge-based economies

in the world. Enhancing the Finnish public sector's ability to envision new business models for tomorrow, as well as maintain and deliver innovative services for social change and sustainable wellbeing is one of the goals of Sitra, the Finnish Innovation Fund.

Innovation: The Design Exchange Program aims to transfer some of the knowledge and experience that Sitra has developed in strategic design through Helsinki Design Lab, envisioning alternative futures and executing projects and services to realize those potentials. The intent of the Design Exchange Program is to offer government new tools for delivering on its commitments and responsibilities. Through a placement program, strategic designers are embedded within project teams in Finland's ministries and municipalities to work as full-time employees for a year. The goals of the project are to build design capability within national and municipal government in Finland; prepare a new generation of promising, capable strategic designers in Finland; accomplish more effective services through direct use of design methods and create a healthy debate about current institutional structures by exploring the potential of strategic redesign. Sitra takes on the role of designing and managing this program, including ongoing support for the embedded designers. Partner institutions play an active role in finding appropriate placement spots and work together with Sitra to define a shared vision of success.

[source: www.helsinkidesignlab.org: <http://insidejob.fi/about/>]

* Since the closing of the Helsinki Design Lab in July 2013, the archive of this project is available at <http://www.helsinkidesignlab.org/dossiers/design-exchange>.

Appendix C: Interview Protocol

Step 1: Explanation

Introduction (Interviewer): *“Hello (name). Thank you so much for taking the time to meet with me today. I really appreciate it. Before getting started, there are a couple of things about the purpose and process of the session that I would like to cover.”*

Purpose and Format for the Interview (Interviewer): *“As you know, I am interested in the shifting role of the designer in social sector projects. I am particularly interested in understanding how designers contribute to and experience collaborative projects that engage multi-disciplinary teams and address large-scale societal issues. That is really the focus on what we are going to talk about today.”*

Confidentiality (Interviewer): *“Everything you share in this interview will be kept in strictest confidence, and your comments will be transcribed anonymously—omitting your name, anyone else you refer to in this interview, as well as the name of your current institution and/or past institutions. Your interview responses will be included with all the other interviews I conduct.”*

Audio Taping (Interviewer): *“To help me capture your responses accurately and without being overly distracting by taking notes, I would like to record our conversation with your permission. Again, your responses will be kept confidential. If at any time, you are uncomfortable with this interview, please let me know and I will turn the recorder off.”*

“Do you have any questions for me before we begin?”

Step 2: Warm-up Questions

1. *Can you tell me how you came to be where you are? Your personal background.*
2. *Can you describe your work today and responsibilities?*
3. *Can you provide some background or overview of this project? How it all began? What is the situation at the moment?*

Step 3: Core Interview Questions:

4. *What would you define are the design outcome(s) of this project? Can you describe them for me?*
5. *Who do you think are the most important actors, people, partners in this project? Why?*
6. *Can you identify/name a non-social-sector project that you were involved in and describe it for me briefly?*
7. *If you had to contrast that project with the social sector one we previously discussed, are there any key similarities and/or differences that you can think of?*

8. *Can you describe how you experienced collaboration in the social sector project?*
9. *How about in the non-social sector one?*
10. *What were the biggest challenges you've encountered? How so?*
11. *What were the highlights, the factors that have made it easier to participate in the social sector project? Why?*

Step 4: Closing

12. *What's next? How do you imagine the project evolving in the future?*
13. *Would you change something about the project if you were to start again, and if so, what would it be? Why?*
14. *Is there anything else you would want to say, or something I have not asked you that you would like to share?*

Interviewer: *Thank you for your time today. It was a pleasure to have this conversation together and I really appreciate your insight. If you are open to my contacting you again, I will use the contact information you provided to do so. Your contact information sheet will be kept in a secured file drawer in my home office and will be shredded by or before May 2014 when this study is completed.*

Appendix D: Survey Constructs and Items

The table below includes the overview of the 7 constructs in our research model and the 87 items used in the original survey. We indicate with * and italics items that were dropped for the measurement model during EFA analysis. Note the reliability given is the reliability of the construct after the removal of items in EFA analysis.

Construct	Item Label	Item
All items measured on a 5-point scale; 1=strongly disagree; 5=strongly agree		
User Participation (UP)		
Responsibility (R) , 4 items	*R1	<i>Users determined key directions during the research phase of the project</i>
$\alpha = 0.786$	R2	During the concept exploration phase of the project, users were responsible in determining key directions
	R3	Users were key partners of the design team in developing the final solution
	R4	In the final development of the project, users were given the opportunity to drive decisions
Hands-on Activities, 2 items	HA1	During the research phase, users were involved in “co-creation” activities (i.e. collaborative creative actions, events or the making of artifacts)
$\alpha = 0.849$	HA2	During the exploration and conceptualization phase of the project, users were involved in “co-creation” activities (i.e. collaborative creative actions, events or the making of artifacts)
Communication (C), 4 items	C1	Users’ input was key to the design proposals generated
$\alpha = 0.814$	C2	Users regularly exchanged information such as facts, opinions, and visions concerning the project with our team
	C3	Users communicated with our team at key junctures of the process
	*C4	<i>Users had a mechanism to communicate feedback to our team throughout the development process of the project</i>
Influence (I), 4 items	I1	Users’ perspectives were a strong source of influence for the final design solution
$\alpha = 0.819$	I2	Users’ input was influential in driving the vision for the design concept selected
	I3	Users’ input was taken into account by our team at all key junctures of the process
	*I4	<i>Users were involved in defining the problem the project would address</i>
DESIGN ATTITUDE (DA)		
Ambiguity Tolerance (AT), 6 items	AT1* (rv)	I am uncomfortable not knowing how a situation is going to unfold
$\alpha = 0.711$	AT2	I am tolerant of ambiguous situations
	*AT3	<i>I enjoy tackling open-ended problems</i>
	AT4	I dislike ambiguous situations

Connecting Multiple Perspectives (CMP), 7 items $\alpha = 0.843$	AT5	I am drawn to ambiguous situations that can be interpreted in more than one way
	*AT6	<i>I am confident about exploring alternatives to problems under ambiguous conditions</i>
	CMP1	I embrace multiple perspectives in my work
	CMP2	I believe that solutions gain from multiple viewpoints
	CMP3	I seek as many perspectives as possible to find the right solution
	CMP4	I strive to incorporate a diversity of perspectives in my process
	CMP5	I connect multiple perspectives with each-other when I design
*Systems Thinking (ST), 5 items	*CMP6	<i>I value forging connections between dissimilar perspectives</i>
	CMP7	I find that the best results engage multidisciplinary perspectives
	ST1	<i>I believe that solutions are interdependent within a larger system</i>
	ST2	<i>I think of the challenge at hand as a component of a larger whole</i>
	ST3	<i>I believe recognizing how the parts of a project fit in the whole context matters</i>
Creativity (C), 5 items $\alpha = 0.662$	ST4	<i>I make an effort to think holistically</i>
	ST5	<i>I believe design outputs can change over time in a system</i>
	*C1	<i>I come up with new ideas to improve processes</i>
	C2	I strive to create appropriate solutions to challenges
	C3	I delight in creative action
Empathy (E), 8 items $\alpha = 0.832$	C4	I am an out-of-the box thinker
	*C5	<i>I enjoy making novel things</i>
	E1	I find that empathizing with people is essential to create appropriate solutions
	E2	I relate to the feelings of others
	*E3	<i>I put myself in someone else's shoes</i>
	E4	I appreciate another person's experience, even if it is foreign to mine
	E5	I relate to the aspirations of others
	E6	I make an effort to capture stakeholders' aspirations in my process
Engagement w/Aesthetics (EA), 5 items $\alpha = 0.694$	E7	I observe people's unique viewpoints
	*E8	<i>I am reflective of the needs of others</i>
	EA1	I find that design solutions must appeal to one's sense of aesthetics above all else
	EA2	I try to balance formal beauty and usability equally when I design
	*EA3	<i>I believe there is no need to sacrifice aesthetics in the service of function</i>
	*EA4	<i>I believe beauty opens the door to function and service</i>
	EA5	I believe that aesthetics in design matters
	*EA6	<i>I have a deep appreciation for the aesthetics of human experience</i>

Prototyping (P), 6 items $\alpha = 0.831$	P1	I believe making ideas tangible is essential to good design
	P2	I find that trying out multiple iterations of ideas as early as possible makes for good design
	P3	I believe learning from failure early is conducive to stronger project outcomes
	P4	I value experimentation through trial and error
	*P5	<i>I believe creating prototypes is critical to the innovation process</i>
	*P6	<i>I value making prototypes to test ideas</i>
Visualization (V), 7 items $\alpha = 0.848$	*V1	<i>I gain key insights from visual information</i>
	*V2	<i>I believe communicating with people through visualization is a strength of design</i>
	V3	I believe visual thinking can reveal solutions to hidden problems
	V4	I find that visualization helps stakeholders better understand the impact of the proposed solution
	V5	I find that visualizing information helps increase partner and/or stakeholder buy-in
	*V6	<i>I use visualization techniques to create a shared level of understanding with stakeholders</i>
Process Satisfaction (PS), 5 items $\alpha = 0.905$	PS1	I was satisfied with the process we followed
	PS2	I found our process satisfying
	PS3* (rv)	I was dissatisfied with the process
	PS4	I was happy with our process
	PS5	I found our project process was effective
Team Learning (TL), 7 items $\alpha = 0.739$	*TL1	<i>Our team regularly took time to figure out ways to improve our processes</i>
	*TL2	<i>Our team frequently sought new information in order to iterate on the concepts developed</i>
	TL3	In our team, someone always made sure that we stopped to reflect on the team's working processes
	TL4	In our team, members often spoke up to test assumptions about ideas under consideration
	*TL5	<i>Our team learned by inviting external feedback</i>
	TL6	In our team, members typically combined and synthesized ideas
	*TL7	<i>Important ideas were made by consensus between team members</i>
SOCIAL INNOVATION PROJECT OUTCOMES		
Novelty (N), 5 items $\alpha = 0.717$	N1	The design resulted in novel outcomes
	*N2	<i>The design pioneered new change</i>
	N3	The design process used novel methods
	*N4	<i>The design outcome had the potential for significant innovation</i>
Societal Impact (SI), 5 items $\alpha = 0.785$	N5	The design process produced novel insights
	*SI1	<i>The design met the social aspirations of its stakeholders</i>
	SI2	The design solution addressed the unmet needs of

		its stakeholders
SI3		The design can improve stakeholder needs not met by current conditions
SI4		The design was an opportunity to fulfill unmet needs
*SI5		<i>The design helped make the world a better place</i>

* Indicates reverse-coded items.

Appendix E: EFA Pattern Matrix Results

Factors	User participation	Empathy	Connecting Multiple perspectives	Proto typing	Aesthetics + Creati.	Visualization	Ambiguity tolerance	Hands on activity	Creativity	* Misc	Influence
AT2							.626				
AT4_rev							.707				
AT5							.727				
C2					.445						
C3									.447		
C4					.393						
CMP1			.517								
CMP2			.748								
CMP3			.673								
CMP4			.687								
CMP5			.373								
CMP7			.655								
A1					.631						
A2					.646						
A5					.643						
E1		.681									
E2		.709									
E4		.727									
E5		.749									
E6		.661									
E7		.652									
P1				.887							
P2				.931							
P3				.614							
P4				.513							
V3						.411				.447	
V4						.323					
V5						.411					
HA2	.431							.477			
HA3								.838			
COM1	.734										
COM2	.728										
COM3	.805										
I1	.622										.411
I2	.705										.323
I3	.639									.385	
R2	.694										
R3	.728										
R4	.698										

(Note: * and misc. and highlights indicate factor cross-loadings)

Appendix F: CFA Analysis

Table F1: 1st Order Constructs: MSV and AVE Results

	CR	AVE	MSV	ASV	R	socialimpact	novelty	TeamL	ProcesSat	CMP	EMP	AT	C	A	Prototype	Visualiz	HA	IN	COM
R	0.786	0.550	0.815	0.207	0.742														
socialimpact	0.785	0.550	0.200	0.102	0.278	0.742													
novelty	0.717	0.459	0.234	0.111	0.223	0.410	0.678												
TeamL	0.739	0.487	0.353	0.120	0.342	0.447	0.374	0.698											
ProcesSat	0.905	0.657	0.353	0.101	0.360	0.351	0.402	0.594	0.810										
CMP	0.843	0.474	0.371	0.122	0.269	0.302	0.271	0.334	0.277	0.689									
EMP	0.832	0.455	0.371	0.133	0.211	0.356	0.266	0.157	0.175	0.609	0.674								
AT	0.711	0.450	0.132	0.042	0.108	0.166	0.343	0.147	0.117	0.202	0.322	0.671							
C	0.662	0.398	0.412	0.152	0.162	0.298	0.461	0.303	0.153	0.459	0.489	0.364	0.630						
A	0.694	0.431	0.412	0.131	0.060	0.335	0.484	0.334	0.240	0.398	0.463	0.025	0.642	0.657					
Prototype	0.831	0.559	0.192	0.061	0.094	0.200	0.053	0.181	0.019	0.319	0.438	0.237	0.417	0.278	0.748				
Visualiz	0.848	0.652	0.381	0.124	0.173	0.291	0.386	0.249	0.155	0.460	0.476	0.106	0.597	0.617	0.345	0.807			
HA	0.849	0.738	0.729	0.160	0.854	0.171	0.288	0.256	0.251	0.266	0.304	0.113	0.182	0.123	0.124	0.185	0.859		
IN	0.819	0.602	0.785	0.220	0.886	0.436	0.216	0.457	0.509	0.299	0.310	0.170	0.270	0.183	0.153	0.225	0.692	0.776	
COM	0.814	0.594	0.815	0.181	0.903	0.267	0.201	0.365	0.312	0.174	0.152	0.113	0.232	0.125	0.131	0.043	0.716	0.845	0.770

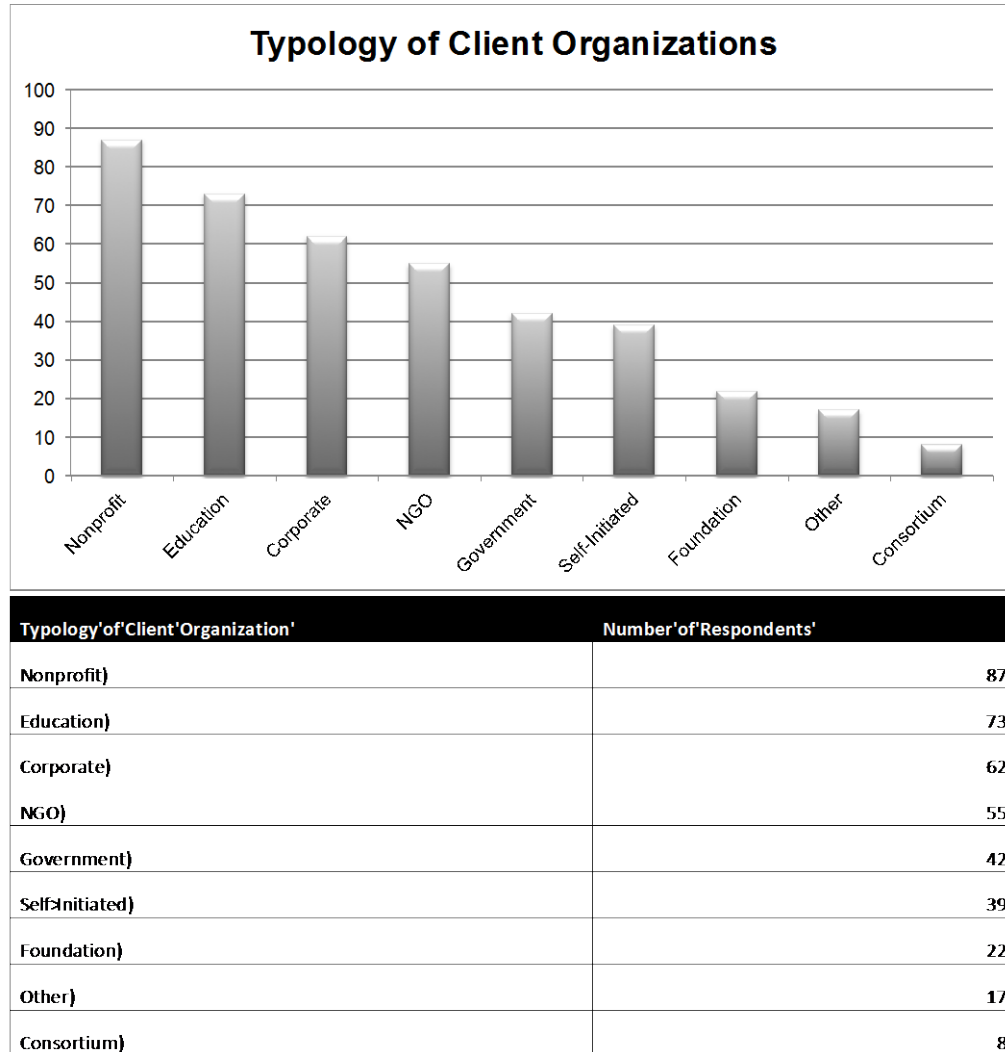
Table F2: 2nd Order Constructs: MSV and AVE Results

	CR	AVE	MSV	ASV	socialinnov	TeamL	ProcesSat	designattitude	Prototype	Visualiz	userparticip
Social Innovation	0.579	0.408	0.573	0.307	0.639						
Team Learning	0.739	0.487	0.407	0.191	0.638	0.698					
Process Satisfaction	0.905	0.656	0.352	0.161	0.590	0.593	0.810				
Design Attitude	0.783	0.434	0.573	0.286	0.757	0.383	0.296	0.659			
Prototype	0.831	0.560	0.272	0.080	0.193	0.180	0.019	0.522	0.748		
Visualization	0.849	0.652	0.530	0.174	0.531	0.249	0.156	0.728	0.346	0.808	
User Participation	0.949	0.825	0.193	0.108	0.439	0.386	0.395	0.323	0.133	0.170	0.908

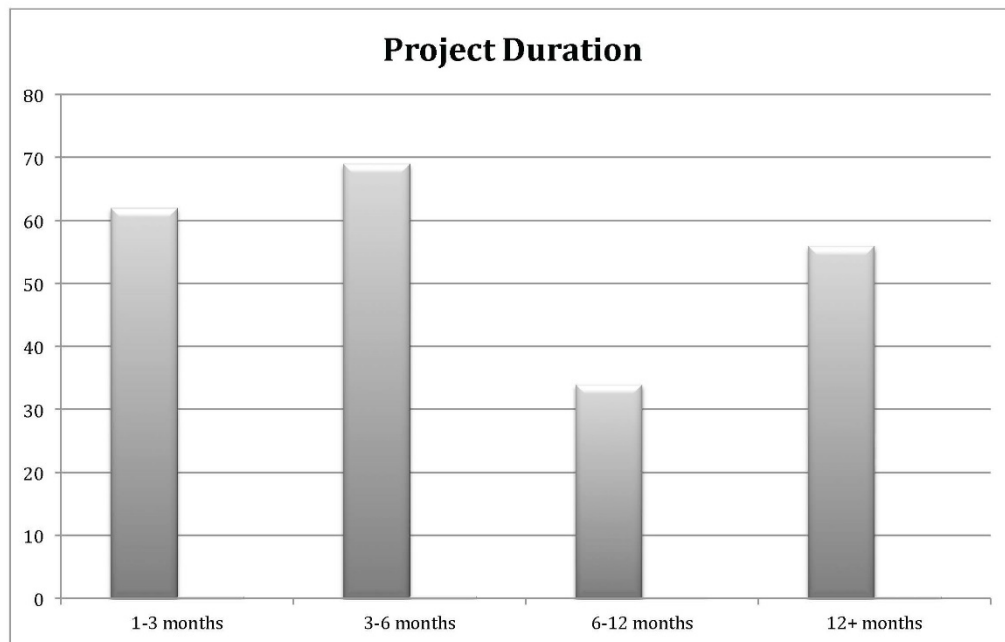
Appendix G: Demographic Data

Demographic Information in the study

1. Typology of Client Organizations



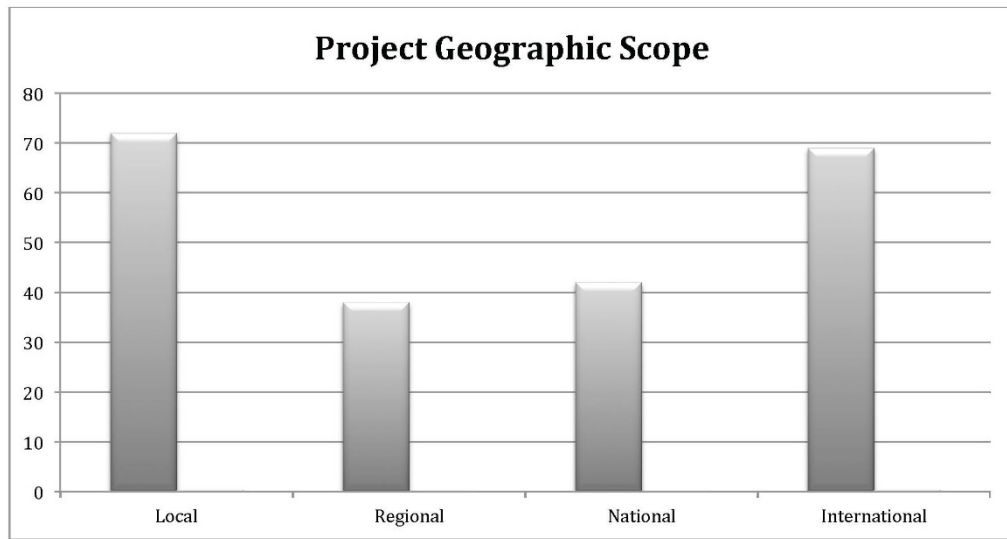
2. Project Duration



Duration	Number of Respondents	Percentage
1-3 months	62	28%
3-6 months	69	31%
6-12 months	34	15%
12+ months	56	25%

?

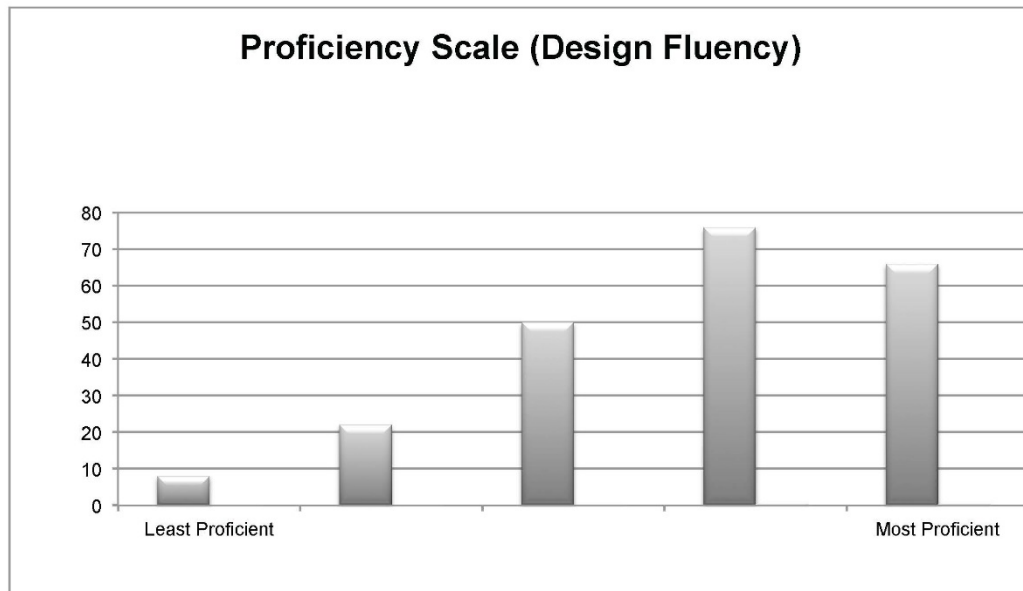
3. Geographic Scope



Geographic Scope	Number of Respondents	Percentage
Local	72	33%
Regional	38	17%
National	42	19%
International	69	31%

5. Design Fluency

This is the control in the study and shows that most respondents in this study fall on the high end of the design fluency spectrum.

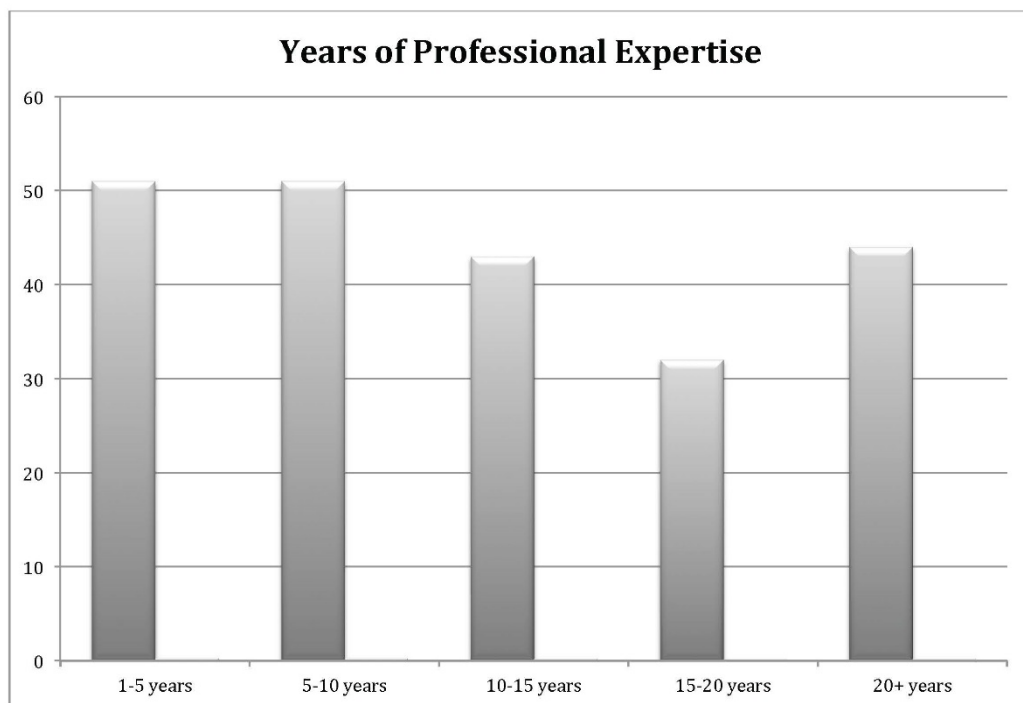


Fluency	Number of Respondents	Percentage
1 Least Proficient	8	4%
2	22	10%
3	50	23%
4	76	34%
5 Most Proficient	66	30%

6. Years of Professional Expertise

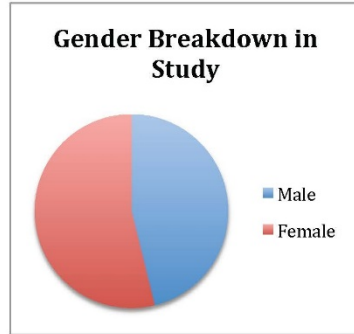


Expertise	Number of Respondents	Percentage
1-5 years	51	23%
5-10 years	51	23%
10-15 years	43	19%
15-20 years	32	14%
20+ years	44	20%

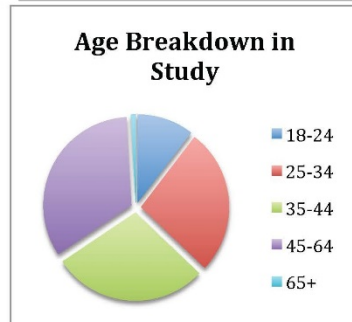


7. Age and Gender

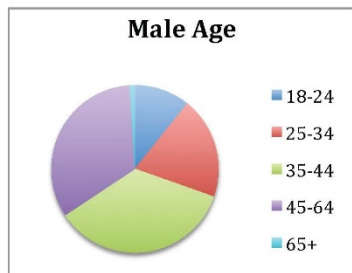
The study participants were evenly distributed in gender.



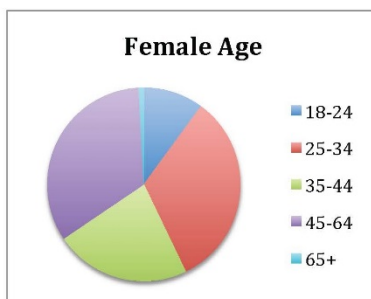
Gender	Number of Respondents	Percentage
Male	102	46%
Female	119	54%



Age	Number of Respondents	Percentage
18-24	23	10%
25-34	59	27%
35-44	63	29%
45-64	74	33%
65+	2	1%

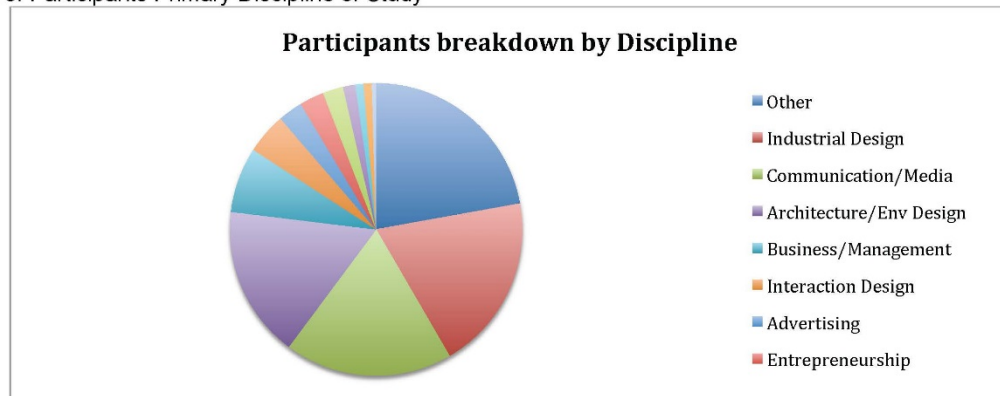


Male Age	Number of Respondents	Percentage
18-24	11	11%
25-34	20	20%
35-44	36	35%
45-64	34	33%
65+	1	1%

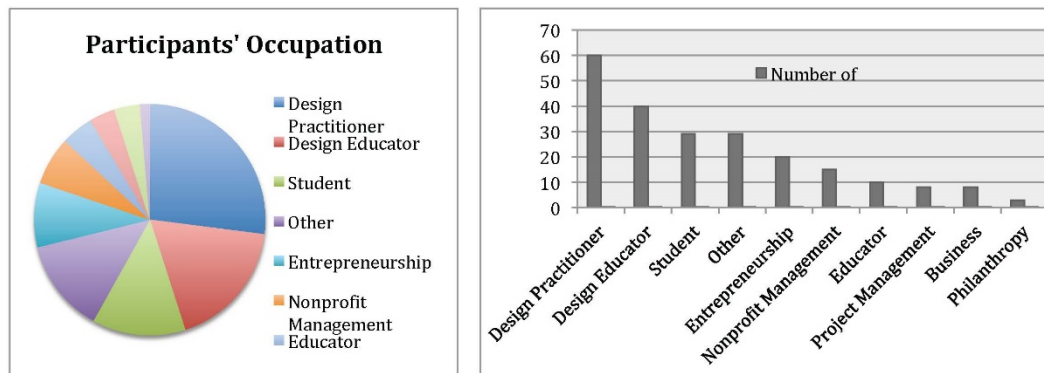


Female Age	Number of Respondents	Percentage
18-24	12	10%
25-34	39	33%
35-44	27	23%
45-64	40	34%
65+	1	1%

8. Participants Primary Discipline of Study

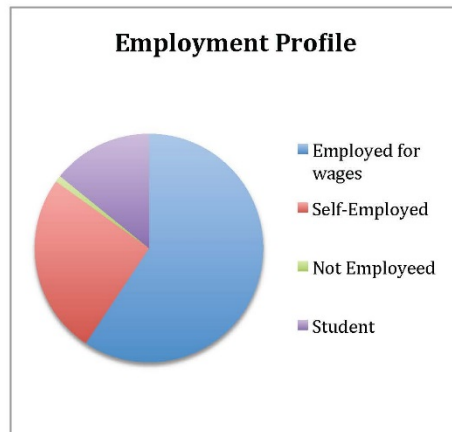


9. Participants Occupation



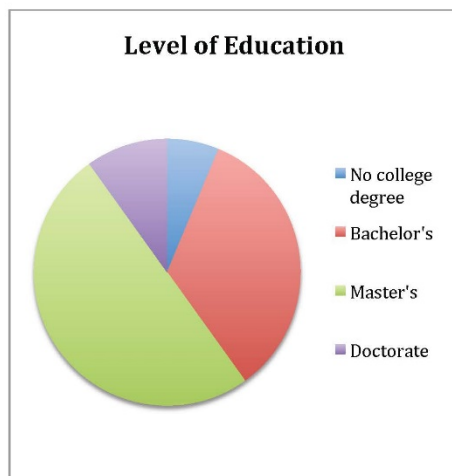
Occupation	Number of Respondents	Percentage
Design Practitioner	60	27%
Design Educator	40	18%
Student	29	13%
Other	29	13%
Entrepreneurship	20	9%
Nonprofit Management	15	7%
Educator	10	5%
Project Management	8	4%
Business	8	4%
Philanthropy	3	1%

10. Respondents Employment Profile



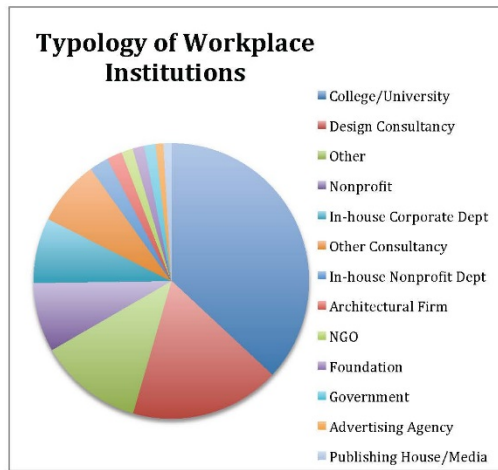
Employment Status	Number of Respondents	Percentage
Employed for wages	130	59%
Self-Employed	56	26%
Not Employed	2	1%
Student	31	14%

11. Education Profile

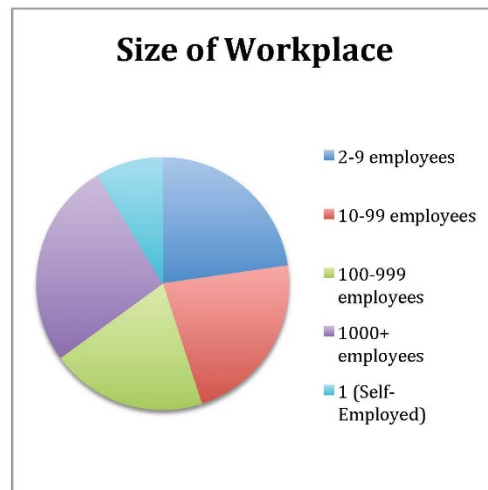


Highest Level of Education Completed	Number of Respondents
No college degree	14
Bachelor's	75
Master's	111
Doctorate	22

12. Workplace Distributions



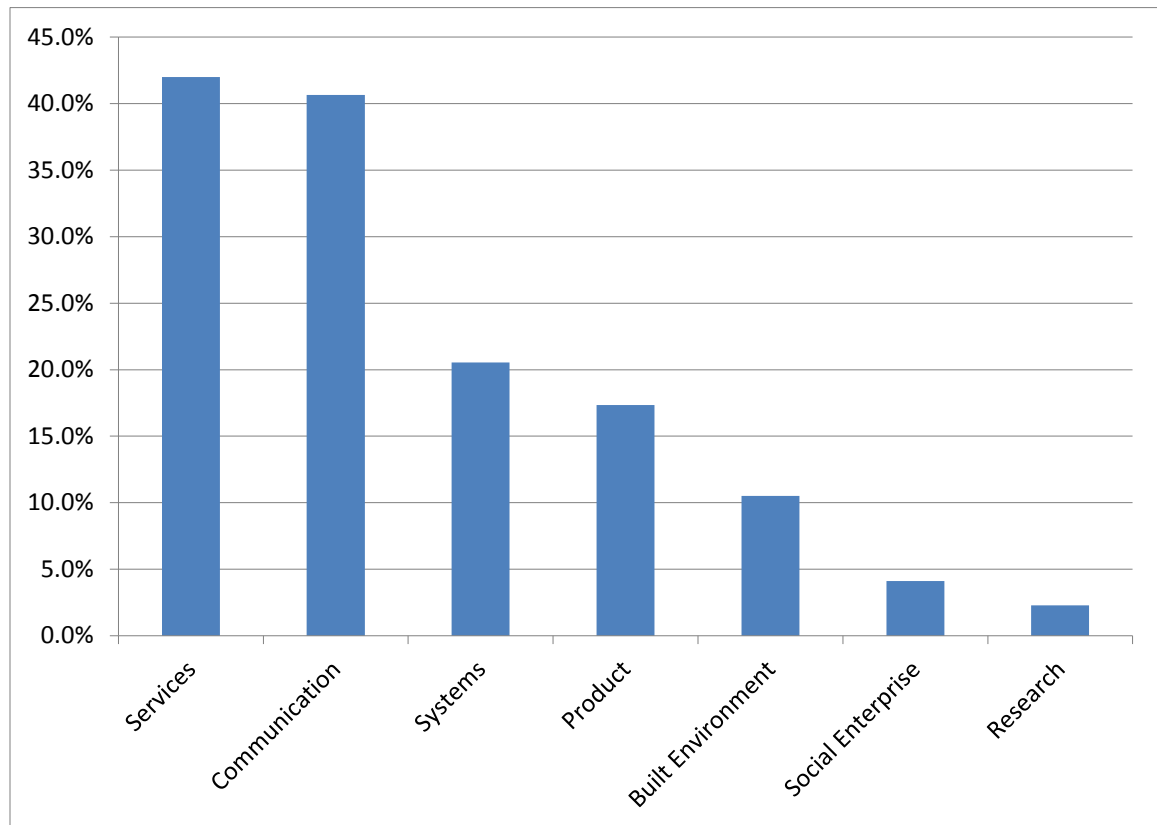
Typology of Institutions	Number of Respondents	Percentage
College/University	82	37%
Design Consultancy	39	18%
Other	27	12%
Nonprofit	18	8%
In-house Corporate Dept	17	8%
Other Consultancy	17	8%
In-house Nonprofit Dept	5	2%
Architectural Firm	4	2%
NGO	3	1%
Foundation	3	1%
Government	3	1%
Advertising Agency	2	1%

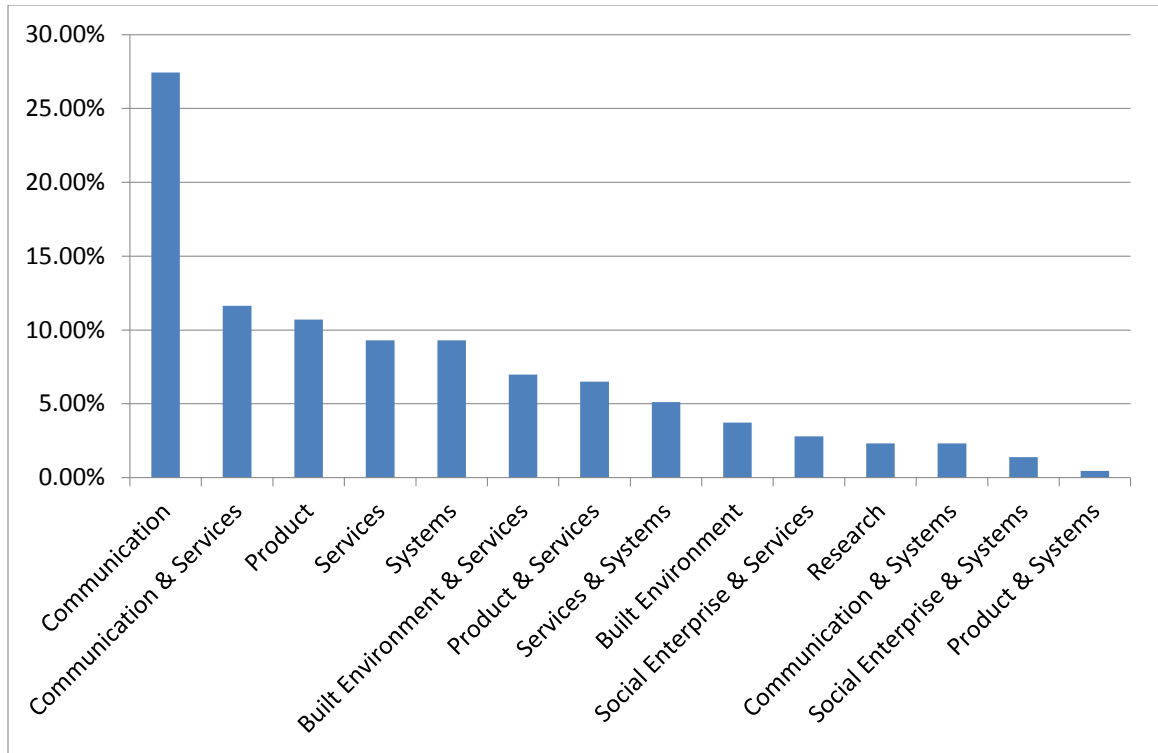


Size of Workplace	Number of Respondents	Percentage
2-9 employees	50	23%
10-99 employees	49	22%
100-999 employees	44	20%
1000+ employees	58	26%
1 (Self-Employed)	19	9%

Appendix H: Typology of Projects in the Dataset

One of the questions in our survey was presented to participants as an open-ended field for them to indicate in a few words the key goals of the project reported. This question aimed at collecting data about the typology of the projects, casting a wide net to understand the types of design disciplines the projects touched upon, as well as the kinds of design challenges and foci designers were working on in the social and public sector. Out of the 233 completed surveys in our dataset, we received 219 responses for this question. Given the qualitative nature of the responses, we coded the responses with broad terms that give a sense of the types of disciplines and challenges that were reported. The codes we put forth are: service design, communication design, systems design, product /industrial design and built environment/architecture, research design. We found that an important number of projects are clearly hybrids, and falling under dual categories such services/communication or built environment/services, for example which is not a surprise. The two graphs below offers a quick overview of the distribution of projects per category and hybrid categories.



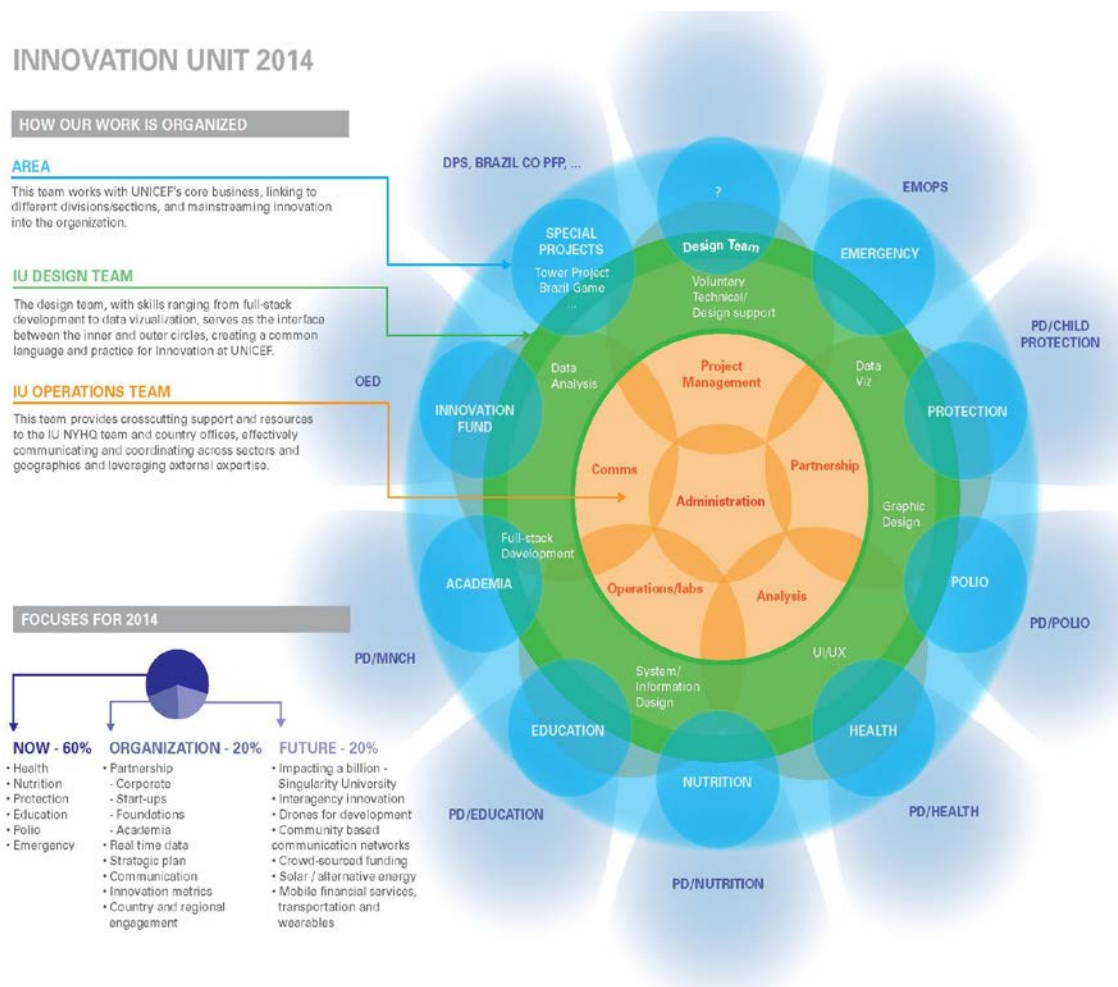


Appendix I: Organizational Charts of the UNICEF Innovation Unit

Organizational Chart 1: June 2014

The chart below is a representation of how the Unit was structured in June 2014. The chart is also included in the Unit's *Innovation Handbook* (version of June 2014) with the specific note that “all roles in blue and green are funded by other Divisions or Country Offices – as are some of the core yellow areas.” The latter statement points to the integration of key functionalities of the Unit within UNICEF at large.

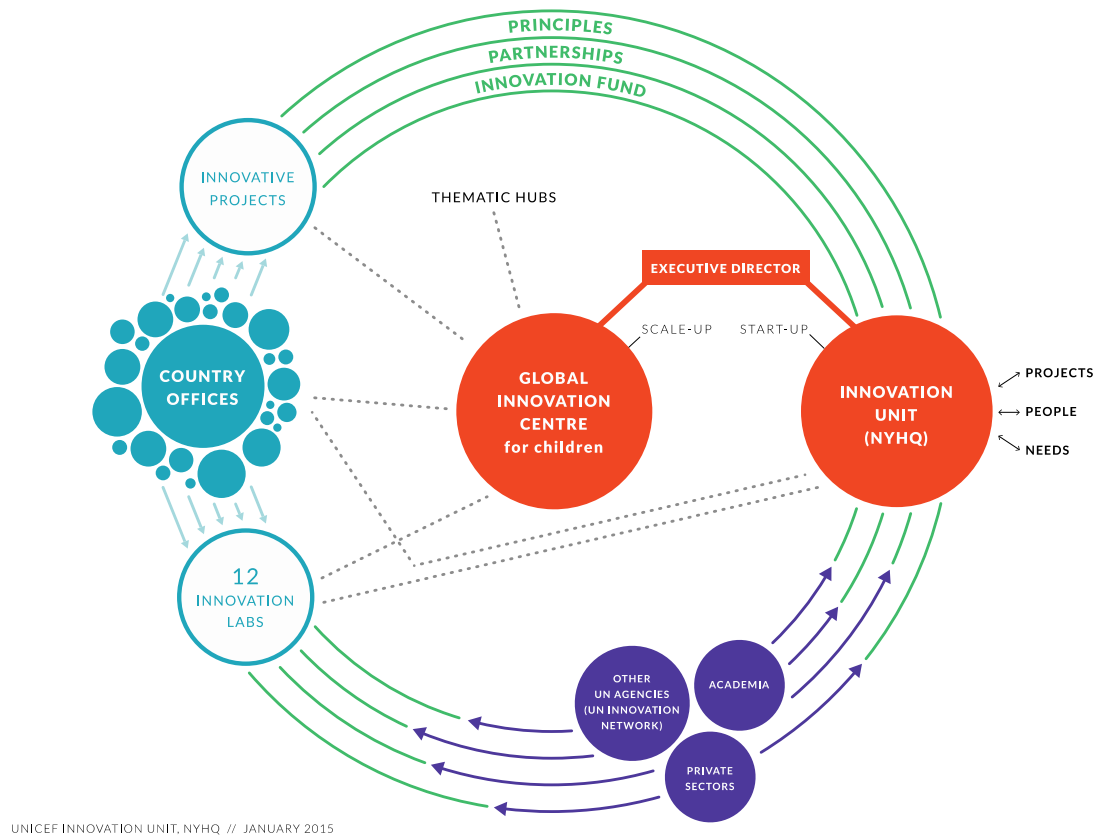
Figure I1: Organizational Chart 1: June 2014



Organizational Chart 2: January 2015

The chart below is a representation of how the Unit is structured as of January 2015 with a more macro level emphasis on principles, partnerships and the innovation venture fund. It shows reporting structure to the Executive Director and ecosystem of innovation throughout the organization.

Figure I2: Organizational Chart 2: January 2015



Appendix J: Sample of Researcher's Field Note Observations

1. UNICEF Headquarters, New York

Thursday June 12

Global Innovation Team Weekly Meeting

- The meeting is scheduled every Thursday morning 9 am. I arrive at 9.05am after security hold up in the lobby. The meeting has started. Chris is already there but does not seem to preside over the conversation, which is being facilitated out of the South Susan office by Stuart (one of the innovation leads there?) I am told later by Chris that team members rotate to facilitate the agenda. I am impressed on how dynamic Stuart sounds keeping the agenda going out of the speaker phone....Chris pitches in once in a while with some key comments.
- The setting is a large conference room, about a dozen team members are all around the table, large speaker phone in the center. Many folks around the world calling in, they announce themselves, they are tuning in via Skype or Google hang out it seems. Bad connectivity here and there, folks drop out and drop in again. I note how young everyone looks to me! Most folks seem to be quite present in the room, listening and typing notes onto Mac Laptop computers. I learn later that they are adding to a collective Google document that is capturing the days' action items, which come up at rapid-fire pace. I have difficulty following the agenda as I am not in front of the Google doc. Reminder to self: need to ask access to the doc.
- RapidPro Discussion: Chris offers an update about who is in the core team. "It is a "public good tool that builds on U-report." The launch date is the GA (general assembly).
- Update from Erica on private sector partnerships
- New team member coming on board, 3 weeks in, Ayano (last name?) she will be in charge of coordination of Innovation Labs. Great background says Chris.
- Sharad is on the call from the Global Innovation Center in Nairobi
- There is a triage of updates, folks around the table and on the other side of the world have 2 minutes for updates, and then everyone can chip in for feedback or questions if they have them.
- Jessica makes an update on the Mobi-Station pilot in Uganda (note to self: I have to find out the latest on what is happening with our grad student Tina's work related to that project- she is going there next month?). There is a MobiStation article coming out on FastCompany Jessica says.
- Report out of Nairobi, Kenya: child protection workshop with youth engagement in the planning
- Meeting will end with a longer presentation (4 minutes!) from Lebanon Country Office. Innovation team is working with Ministry of Social Affairs. I lean over to follow the power point that is being discussed. Government is in flux, hard to push through with the initiative- seems to be about a digital service to bring together a network of social workers? Many challenges. How can U-report work here better?
- The facilitator of the meeting interrupts: "let's cluster challenges around visual learning/content; policy/governance and benefits/ impact."

The discussion continues, more folks pitch in now.

Meeting is about to end at the hour-sharply. I leave with Chris onto his next meeting.

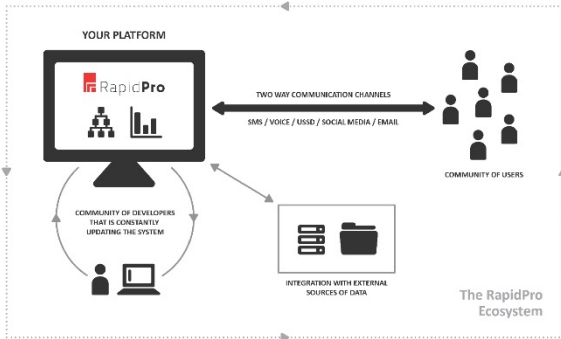
Appendix K: UNICEF RapidPro Toolkit

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[about](#) [sign in](#)

Overview

RapidPro is a platform that allows the international development community to visually build nationally scalable mobile-based applications from anywhere in the world.

RapidPro powers the connection between government leaders and the most important voices in their countries, while allowing organizations to connect those voices across borders and geographies.



RapidPro has been built on the experience of 7 years of innovation in the most difficult operating environments in the world, and will serve as the next-generation of RapidSMS - UNICEF's open-source SMS framework for mobile phone-based systems. This platform is also built off a set of principles of innovation agreed upon and endorsed by UNICEF, UNDP, WFP, UNHCR, USAID, the World Bank, IKEA Foundation and others.

RapidPro serves as the next generation platform of RapidSMS - a free and open-source framework for rapidly building mobile services for scale. More powerful and user friendly features are included, such as:

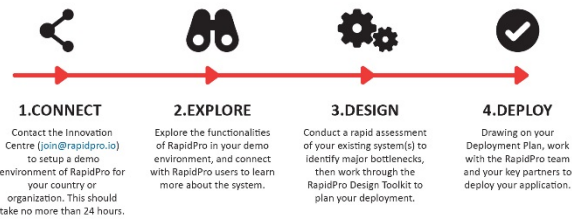
- Ability to visually build and control your own workflows through a web-based interface;
- Robust analytics for aggregated data reports and mapping of poll results without in-depth software development knowledge;
- Personalized broadcasts and audience management;
- Multi-channel communication integration;

Plus, the cloud-based architecture of RapidPro will:

- Streamline negotiations with Mobile Network Operators for activation of applications;
- Limit software development redundancies by multiple vendors;
- Engage an active open source community for software development;
- Centralize security management.

Getting Involved

Want to get connected to RapidPro? Here are a few steps you can take.



- 1.CONNECT**
Contact the Innovation Centre (join@rapidpro.io) to setup a demo environment of RapidPro for your country or organization. This should take no more than 24 hours.
- 2.EXPLORE**
Explore the functionalities of RapidPro in your demo environment, and connect with RapidPro users to learn more about the system.
- 3.DESIGN**
Conduct a rapid assessment of your existing system(s) to identify major bottlenecks, then work through the RapidPro Design Toolkit to plan your deployment.
- 4.DEPLOY**
Drawing on your Deployment Plan, work with the RapidPro team and your key partners to deploy your application.

This shows an early iteration (August 2015) of the about landing page of the RapidPro site (<https://www.rapidpro.io/>) introducing the platform.

Appendix L: Principles of Innovation and Technology in Development

The UNICEF innovation principles have been endorsed or adopted by the following partners: UNICEF, USAID, Gates Foundation, EOSG Global Pulse, WFP, WHO, HRP, OCHA, UNDP, SIDA, IKEA Foundation, UN Foundation, and UNHCR.

1. Design with the User

- Develop context appropriate solutions informed by user needs.
- Include all user groups in planning, development, implementation and assessment.
- Develop projects in an incremental and iterative manner.
- Design solutions that learn from and enhance existing workflows and plan for organizational adaptation.
- Ensure solutions are sensitive to, and useful for, the most marginalized populations: women, children, those with disabilities, and those affected by conflict and disaster.

2. Understand the Existing Ecosystem

- Participate in networks and communities of like-minded practitioners.
- Align to existing technological, legal, and regulatory policies.

3. Design for Scale

- Design for scale from the start, and assess and mitigate dependencies that might limit ability to scale.
- Employ a “systems” approach to design, considering implications of design beyond an immediate project.
- Be replicable and customizable in other countries and contexts.
- Demonstrate impact before scaling a solution.
- Analyze all technology choices through the lens of national and regional scale.
- Factor in partnerships from the beginning and start early negotiations.

4. Build for Sustainability

- Plan for sustainability from the start, including planning for long-term financial health i.e., assessing total cost of ownership.
- Utilize and invest in local communities and developers by default and help catalyze their growth.
- Engage with local governments to ensure integration into national strategy and identify high-level government advocates.

5. Be Data Driven

- Design projects so that impact can be measured at discrete milestones with a focus on outcomes rather than outputs.
- Evaluate innovative solutions and areas where there are gaps in data and evidence.
- Use real-time information to monitor and inform management decisions at all levels.
- When possible, leverage data as a by-product of user actions and transactions for assessments.

6. Use Open Standards, Open Data, Open Source, and Open Innovation

- Adopt and expand existing open standards.
- Open data and functionalities and expose them in documented APIs (Application Programming Interfaces) where use by a larger community is possible.
- Invest in software as a public good.
- Develop software to be open source by default with the code made available in public repositories and supported through developer communities.

7. Reuse and Improve

- Use, modify and extend existing tools, platforms, and frameworks when possible.
- Develop in modular ways favoring approaches that are interoperable over those that are monolithic by design.

8. Do no harm

- Assess and mitigate risks to the security of users and their data.
- Consider the context and needs for privacy of personally identifiable information when designing solutions and mitigate accordingly.
- Ensure equity and fairness in co-creation, and protect the best interests of the end end-users.

9. Be Collaborative

- Engage diverse expertise across disciplines and industries at all stages.
- Work across sector silos to create coordinated and more holistic approaches.
- Document work, results, processes and best practices and share them widely.
- Publish materials under a Creative Commons license by default, with strong rationale if another licensing approach is taken.

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