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Human-Centered Design for Social Impact:
Case Studies of IDEO.org and the International Development Design Summit

By

Jessica Vechakul

A dissertation submitted in partial satisfaction of the
requirements for the degree of
Doctor of Philosophy

in

Engineering – Mechanical Engineering
and the Designated Emphasis

in

Development Engineering

in the

Graduate Division

of the

University of California, Berkeley

Committee in charge:
Professor Alice M. Agogino, Chair
Professor Lisa A. Pruitt
Professor Sara L. Beckman

Spring 2016

Human-Centered Design for Social Impact:

Case Studies of IDEO.org and the International Development Design Summit

Abstract

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By
Jessica Vechakul

Doctor of Philosophy in Mechanical Engineering and
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University of California, Berkeley

Professor Alice M. Agogino, Chair

In the social sector, programs often fail due to a lack of understanding of the norms, knowledge, and needs of the people who execute and benefit from the solutions offered by those programs. Human-Centered Design (HCD) offers a broadly-applicable problem-solving framework and methods for developing an in-depth understanding of people who are directly impacted by development challenges, generating creative ideas, and rapidly learning from small-scale pilots.

As HCD is an emerging practice in the social sector, a critical first step is an exploratory case study. Using the Social Blueprint framework, I characterized two drastically different approaches for teaching and practicing HCD for Social Impact. IDEO.org's Fellowship program represents a Project-Based Consulting Model in which professional design teams partner with social enterprises, nonprofits, and foundations to design and implement scalable products and services. During the one-year Fellowship program, social sector leaders learn HCD by working on design consulting projects with experienced designers. The International Development Design Summit (IDDS) program represents a Creative Capacity Building Model, in which students and members of low-income communities learn to design appropriate technologies and launch social enterprises. IDDS is an educational conference that aims to put participants on a lifelong path dedicated to social innovation.

These exploratory case studies consist of a qualitative analysis of documents, participant observations, and key informant interviews. All the key informants were employees or volunteers previously or currently working with the organizations in this research study. By analyzing the evolution of IDEO.org from 2011 to 2015 and of IDDS from 2007 to 2015, I identified challenges associated with trying to achieve impact through the dual goals of design education and practice. IDEO.org addressed these challenges by developing programs with distinct missions focused on either goal. IDDS maintained its multifaceted mission, and developed a Social Innovation Ecosystem of complementary programs and resources to better support its dual goals.

The literature on strategic fit suggests that all building blocks of an organization's or program's social blueprints must be aligned to achieve its mission or anchor purpose. Despite the shared emphasis on the HCD process, IDEO.org's Fellowship program and IDDS program produced outcomes that aligned with their respective social blueprint building blocks. My comparison of IDEO.org's and IDDS's design processes also suggests that the HCD process is not a static process, but rather is heavily influenced by organizational and project contexts. I developed in-depth case studies of an IDEO.org project and an IDDS project to illustrate the

differences in their approaches and identify factors that may influence the progression of projects from the design stage to the pilot stage.

HCD has great potential for generating innovative solutions to address the challenges of poverty. This dissertation builds a foundation for understanding how to better design for social impact by examining the experience of two renowned pioneering organizations.

For my uncle, who taught me, "Life is for you to enjoy."

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Glossary

CCB. Creative Capacity Building is IDDS's model for teaching people to create technology as a way "to identify or affirm their own abilities, to invite communities to seek solutions together, and to build towards meaningful influence over their lives and livelihoods" (Taha, 2011, p. 13).

CGAP. Consultative Group to Assist the Poor is an independent policy and research center dedicated to advancing financial access for the world's poor. It is mentioned in this dissertation as one of IDEO.org's partner organizations.

D-lab. The D-lab is a program offered by MIT. D-lab offers interdisciplinary courses that emphasize experiential learning, real-world projects, and community-led development (D-lab, 2015a).

design education. This dissertation refers frequently to the multifaceted mission of trying to achieve impact through both design education and design practice. The design education component of this mission is to teach the design process and methods. The social impact of design education is capacity building, and may include skills such as the ability to frame a problem, identify user needs, generate ideas, or prototype. Capacity building may also entail an adoption of the HCD mindset, which might include developing empathy for users, embracing ambiguity, testing ideas through tangible experiments and interactions with users, and iterating to evolve a more robust and promising solution (IDEO.org, 2015a).

design facilitator. A volunteer with experience in design, engineering, or international development, who mentors IDDS design teams.

design practice. This dissertation refers frequently to the multifaceted mission of trying to achieve impact through both design education and design practice. The design practice component of this mission is to develop innovative products, services, or programs that improve quality of life for vulnerable or marginalized populations. The social impact of design practice may include increased income, enhanced health, or expansion of opportunities.

HCD. Human-centered design is a broadly-applicable problem-solving framework for creating holistic solutions that find harmony between social factors, financial viability, and technological and organizational feasibility (IDEO, 2011). The HCD process provides a structure and methods for developing an in-depth understanding of people who are directly impacted by an issue, generating creative ideas, and rapidly learning from small-scale pilots.

IDDS. The International Development Design Summit is an educational conference that aims to inspire people to create positive change in the world.

IDEO. IDEO is a global for-profit design consultancy renowned for popularizing design thinking or human-centered design in the commercial sector.

IDEO.org. IDEO.org is a nonprofit organization founded by IDEO, and with a mission focused on bringing design thinking or HCD to the social sector.

IDIN. The International Development Innovation Network is an organization that aims to support a global network of innovators to bring technologies that solve problems in poverty to scale. It consists of several programs and resources, including the IDIN Network, Innovation Centers, Microgrants, and IDIN research.

IDIN Network. All former IDDS participants and organizers are automatically included in the IDIN Network. An IDIN Network Coordinator provides resources (e.g., funding, mentorship, etc.) to support Network members to continue working on IDDS projects or on other social innovation endeavors.

innovation. Innovation is the creation of new ideas or novel applications of existing ideas that add value. IDDS's definition of *innovative* means new to the design team or new to the community, but not necessarily new to the world.

Innovation Center. IDIN Innovation Centers serve as outreach centers providing training in design to community members, a community space to share and test ideas for development solutions, a workshop space with tools for prototyping, and a marketplace for network members to showcase, buy, and sell development technologies (IDIN, 2015d).

measurable impact. A term used by IDEO.org to describe the type of quantifiable success each design engagement aims to achieve. Examples could be the number of users served by a service or program or the number of units of a product being used.

MIT. The Massachusetts Institute of Technology is a top-ranked technology-focused university in the United States.

MSI. Marie Stopes International is a foundation dedicated to promoting reproductive health. It is mentioned in this dissertation as one of IDEO.org's partner organizations.

organizer. A volunteer who helps to organize an IDDS conference. Examples of roles include selecting projects, selecting participants, managing the budget, etc.

product. Products are solutions that have been developed to the point of benefiting users, and may perhaps be sold or otherwise disseminated. Technologies, businesses, or systems can be considered products.

project. A project is the set of activities IDDS teams engage in to address design challenges.

prototype. A prototype is a tangible manifestation of a concept that is designed for a test or experiment that will further the development of a product.

scale. When this term is used in the context of achieving social impact at "scale," it refers to a magnitude of impact, such as individual, regional, national, international.

technology. A technology is the manipulation of materials to perform an intended function or purpose.

Acknowledgments

More than a matter of research interest, this work has catalyzed an introspection of my design philosophy and practice. As this work has challenged me to grow both personally and professionally, I'd like to acknowledge many more people than is customary in a dissertation. Please forgive any omissions, for they are genuinely unintentional.

My experiences with IDEO.org and the International Development Design Summit (IDDS) have shaped my vision of how design can change lives. I am grateful to have had the opportunity to think deeply about how others can learn from the experiences of these pioneering organizations. Thank you to all the interviewees who generously volunteered their time, honest reflections, and insights. Your quotes are the heart and bones of this work.

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Chapter 1

Introduction

1.1 Human-Centered Design (HCD) for Social Impact

Socioeconomic development projects are too often designed and implemented without involving people who are the intended users of the solution. As a result, ineffective solutions neglect social factors, such as family dynamics or cultural preferences. Traditional approaches that focus on technology or donation-based models are failing to alleviate poverty (Polak, 2008).

Human-centered design (HCD) offers a broadly-applicable problem-solving framework for creating holistic solutions that find harmony between social factors, financial viability, and technological and organizational feasibility (IDEO, 2011). The HCD process provides a structure and methods for developing an in-depth understanding of people who are directly impacted by an issue, generating creative ideas, and rapidly learning from small-scale pilots. Although the design process and methods may vary in practice, the approach may be considered HCD if design decisions are guided by the needs of potential users or people whose experiences will be transformed by the design (Dym, Agogino, Eris, Frey, & Leifer, 2005; Gasson, 2003). The prioritization of user needs distinguishes HCD from other product design approaches, such as "technology push" in which technology is the driver of a project, or "market pull" in which economics are the driver.

HCD is sometimes referred to as "design thinking." According to an early definition proposed by Peter Rowe in 1987, design thinking is the "situational logic and the decision making process of designers" and the "theoretical dimensions that both account for and inform this kind of undertaking" (Rowe, 1987, p. 2). Rowe initially used this term to describe the methods and approaches used by architects and urban planners. In 1992, Richard Buchanan offered a broader view of "design thinking" as a unified way of thinking that integrates "symbolic and visual communications," "material objects," "organized activities and services," and "complex systems for living, working, playing, and learning" to address the needs and values of people (Buchanan, 1992, pp. 9-10). According to Buchanan, "design problems are 'indeterminate' because design has no special subject matter of its own apart from what a designer conceives it to be" (Buchanan, 1992, p. 16). In other words, design thinking can be applicable to any subject. Design thinkers are process experts, and can apply the HCD process to various fields, even subjects in which they have limited or no expertise.

Although designers frame "design thinking" as universal in scope with applicability to any area of human experience (Buchanan, 1992), the general public typically associates design with

creative experts improving the aesthetics or functionality of tangible products. Design thinking is practiced by successful companies (e.g., Intel, Intuit, Proctor & Gamble, etc.) to innovate in the commercial sector. However, design thinking is just beginning to emerge as an approach for addressing social sector challenges. Some thought leaders in the design industry (e.g., Tim Brown, the Executive Director of IDEO) have been making the case for how everyone can practice "design thinking" as a powerful strategy for addressing abstract, multifaceted challenges in the social sector (Brown & Katz, 2011; Brown & Wyatt, 2010).

Brown and Katz highlight the power of design thinking to address complex societal challenges and create revolutionary change (Brown & Katz, 2011). Design thinking is particularly powerful as tool for addressing what Rittel and Webber (1973) describe as "wicked problems" (Buchanan, 1992). Although HCD is not commonly used by organizations in the social sector, complex societal issues exhibit the properties of wicked problems (see Table 1.1) that HCD is particularly apt to address.

In addition, since development practitioners often come from a different cultural and socio-economic context than their users, HCD methods for facilitating empathy can be crucial for ensuring that the project actually meets user needs and is suitable for their context of use. In fact, HCD is emerging as an approach for innovating solutions to address issues of poverty in the United States and developing countries. For example, the HCD process has been used to address the need for clean water and sanitation in developing countries.

1.2 The Human-Centered Design Process

Although the design process can be represented in various forms (e.g., a linear series of steps, a cycle, or spiral) and may contain different steps with different names and distinctions between each stage (Eisenbart, Blessing, & Gericke, 2012; Roschuni, 2012), design processes typically begin with the *analytic* phases of trying to define and understand the problem, and concludes with the *synthetic* phases of experimentation and invention (Owen, 2001). The design process is a cyclical and iterative process moving from the realm of concrete where the problem is grounded in reality to the realm of abstract where we may broaden our thinking, and back to concrete to test promising ideas in tangible form. The design process may be simplified as problem finding (the analytical phase of moving from concrete to abstract), and solution finding (the synthetic phase of moving from abstract to concrete) (see Figure 1.1).
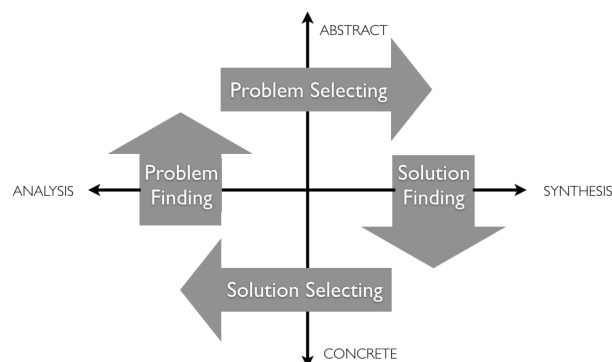
Figure 1.1. The design process can be represented as problem finding, problem selecting, solution finding, and solution selecting. Adapted from (Beckman & Barry, 2007, p. 44)

Table 1.1. The properties of wicked problems, and my perspective on how the challenges of poverty can be framed as wicked problems, and the potential applicability of HCD for addressing wicked problems

Properties of Wicked Problems (Rittel & Webber, 1973)	Framing Challenges of Poverty as Wicked Problems	Potential Applicability of HCD for Addressing Wicked Problems
It is not possible to frame a problem statement containing all the information necessary to solve it.	Challenges of poverty are complex, and development experts often have to make decisions despite the intrinsic uncertainties and unknowns.	The HCD mindset of embracing ambiguity enables designers to explore many possibilities without clinging to any particular idea so that the most promising solution will reveal itself.
There are no intrinsic rules for stopping so projects typically end because of external constraints such as time or money.	Standards for quality of life and conditions of health and wellness are subjective. There is no intrinsic indisputable end for projects addressing challenges of poverty.	Design project cycles can build momentum to address long-term goals through a series of short-term milestones.
Solutions are not simply right or wrong; instead, they are judged differently by multiple entities who are influenced by interests, values, and preferences.	Different stakeholders, including policy makers, funders, implementers, and beneficiaries, will have differing opinions of the suitability of a solution.	HCD offers methods for empathizing with various stakeholders, and harmonizing social factors, financial viability, and technical feasibility to create holistic systemic solutions.
There is no immediate and no ultimate test of a solution that can take into account all unintended consequences.	Challenges of poverty often involve tradeoffs, and interrelated effects that cannot all be predicted.	HCD encourages iteration and frequent small-scale experimentation to mitigate risks. Although no single test is sufficient to assess a solution, multiple experiments can help to identify the most promising solutions.
Every implemented solution leaves some traces that cannot be undone.	Any intervention involving people shapes relationships and trust.	HCD encourages prototyping to make abstract ideas tangible and concrete. This helps to ground ideas in reality and reveal potential challenges and possibilities that can guide implementation.
There is no prescribed list of actions; the plan of action for reaching a solution relies on realistic judgment.	Determining which steps are necessary and ethical requires judgment considering the context.	The HCD process is not a standardized series of steps, but rather a highly adaptive process that can be modified to suit various contexts.
Each problem is essentially unique and cannot be grouped into classes for which certain steps or solutions apply.	Some mathematical problems can be classified and solved with the same series of steps. Challenges of poverty cannot be addressed formulaically.	The HCD mindset of having creative confidence can help people trust their intuition and figure out how to solve problems in unexplored spaces.
Each problem is a symptom of another "higher level" problem.	Each challenge of poverty (e.g., deaths from diarrheal diseases) can be viewed as a result of more upstream factors (e.g., unclean water, inadequate infrastructure, or structural inequities).	HCD offers multiple methods for gathering and synthesizing information to identify the problem and develop the most appropriate problem framing.
There are multiple ways to frame a problem, and every problem framing suggests a realm of possible solutions.	For example, deaths from diarrheal diseases can be addressed by education campaigns, purification of water supplies, improved sanitation systems, etc. depending on how the problem is framed.	HCD emphasizes the importance of identifying and framing the problem because the problem definition determines the realm of potential solutions.
Since the aim is to improve some characteristics of the world in which people live, "failing" has extreme consequences.	Especially for people living in poverty with limited resources, failure may mean decreased quality of life or lives lost.	HCD encourages optimism, which can provide the generative energy needed to navigate the constraints and risks, and innovate solutions to the world's most intractable problems.

Beckman and Barry integrated the design process with learning styles to create a model of the design process (see Figure 1.2) that illustrates how the design process "requires participants to engage in concrete experience and abstract conceptualization, reflective observation and active experimentation, thus exercising all four learning styles" (Beckman & Barry, 2007, p. 29). This model of the HCD process starts with observations to understand user needs and the context of the problem. Design teams observe what people say and do and seek to understand how they think and feel. For example, a team may ask a user to give them a guided tour of her home; asking a user about her routines can also help the team better understand her values. Empathy is especially important in the development sector, in which practitioners often come from a different cultural and socio-economic context than their users. Next, insights are distilled from the observations, and design teams may construct frameworks (e.g., a visualization of a customer's journey) to find relevant patterns and reframe the problem. Then, ideas are generated to meet a set of imperatives or prioritized user needs. Finally, the most promising concepts are tested and refined to create new experiences and tangible solutions.
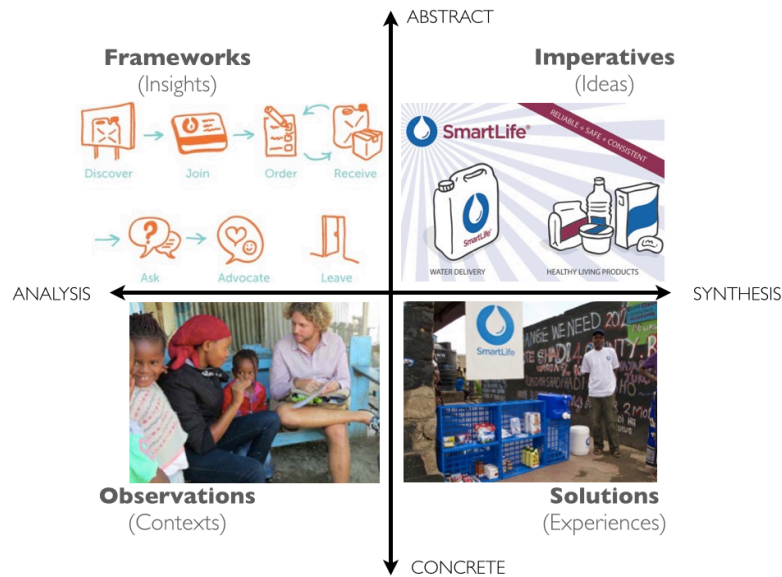
Figure 1.2. The HCD process adapted from (Beckman & Barry, 2007, p. 47) and illustrated with pictures from IDEO.org's SmartLife project (IDEO.org, 2013)

Beckman and Barry also emphasized the importance of diverse teams for the design process by demonstrating how individuals with different learning styles thrive during different phases of the design process (see Figure 1.3). The diverging learning style is best suited for the observations phase of the design process because they are good at seeing concrete situations from multiple viewpoints (Beckman & Barry, 2007). The assimilating learning style is best suited for the frameworks phase of the design process because they are good at understanding a wide range of information and putting it in a concise, logical form (Beckman & Barry, 2007). The converging learning style is best suited for the imperatives phase of the design process because they are good at finding practical uses for ideas and theories (Beckman & Barry, 2007). The accommodating learning style is best suited for the solutions phase of the design process because they are good at learning from hands-on experiences (Beckman & Barry, 2007). All individuals are capable of functioning in each phase of the design process and utilizing each learning style. However, individuals tend to have a preferred learning style and strength in the

corresponding phase of the design process. Diverse design teams can leverage the distinctive strengths of each member.
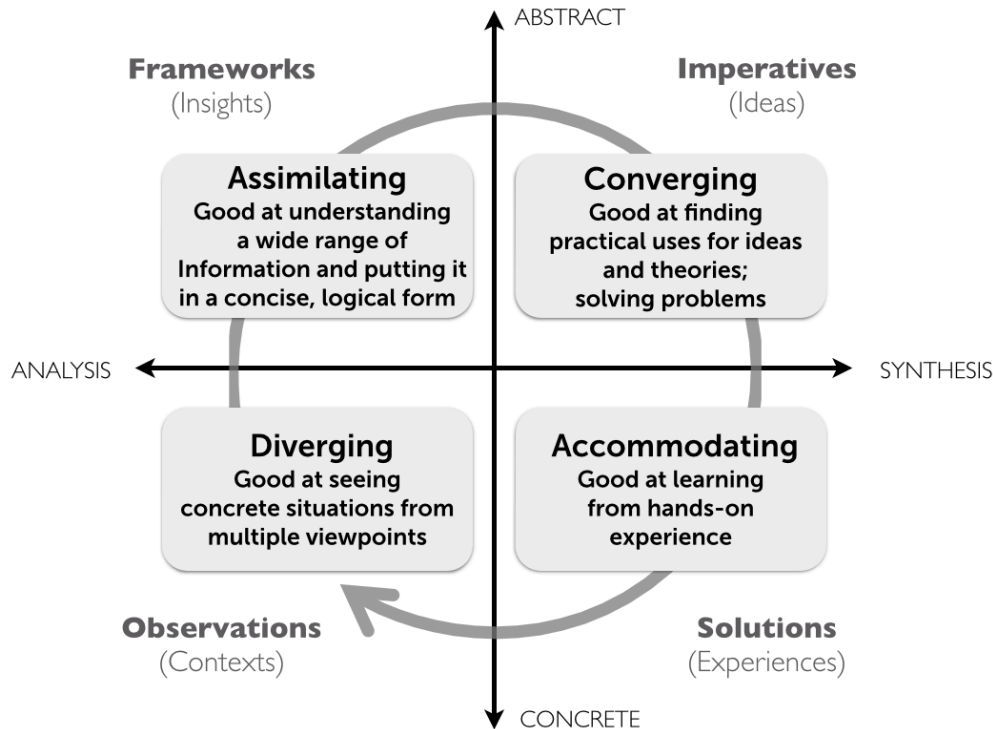
Figure 1.3. The HCD process and learning styles (adapted from Beckman & Barry, 2007, p. 47).

1.3 Overview of Two HCD for Social Impact Models

As HCD is an emerging practice in the social sector, a variety of organizations have started programs to develop social innovation capability. The question arises as to what lessons can be learned from pioneering organizations and programs that teach and practice HCD for Social Impact. A critical first step in understanding this question is an exploratory study. This thesis will characterize two drastically different approaches to design education and design practice for social impact. The characterization of these HCD approaches is based on analyses of two design programs and a design project emerging from each of the two programs. This study also highlights the strengths and limitations of each approach to inform the creation of other HCD for Social Impact programs.

The Project-Based Consulting Model

IDEO.org's Fellowship program represents a Project-Based Consulting Model in which professional design teams partner with social sector organizations to design scalable products and services. During the one-year Fellowship program, social sector leaders learn HCD by working on design consulting projects with experienced designers. IDEO.org has demonstrated promising results with some projects resulting in pilot programs serving thousands of customers (see Figure 1.4). The pilot programs span a range of sectors including water and sanitation, financial services, and agricultural programs.
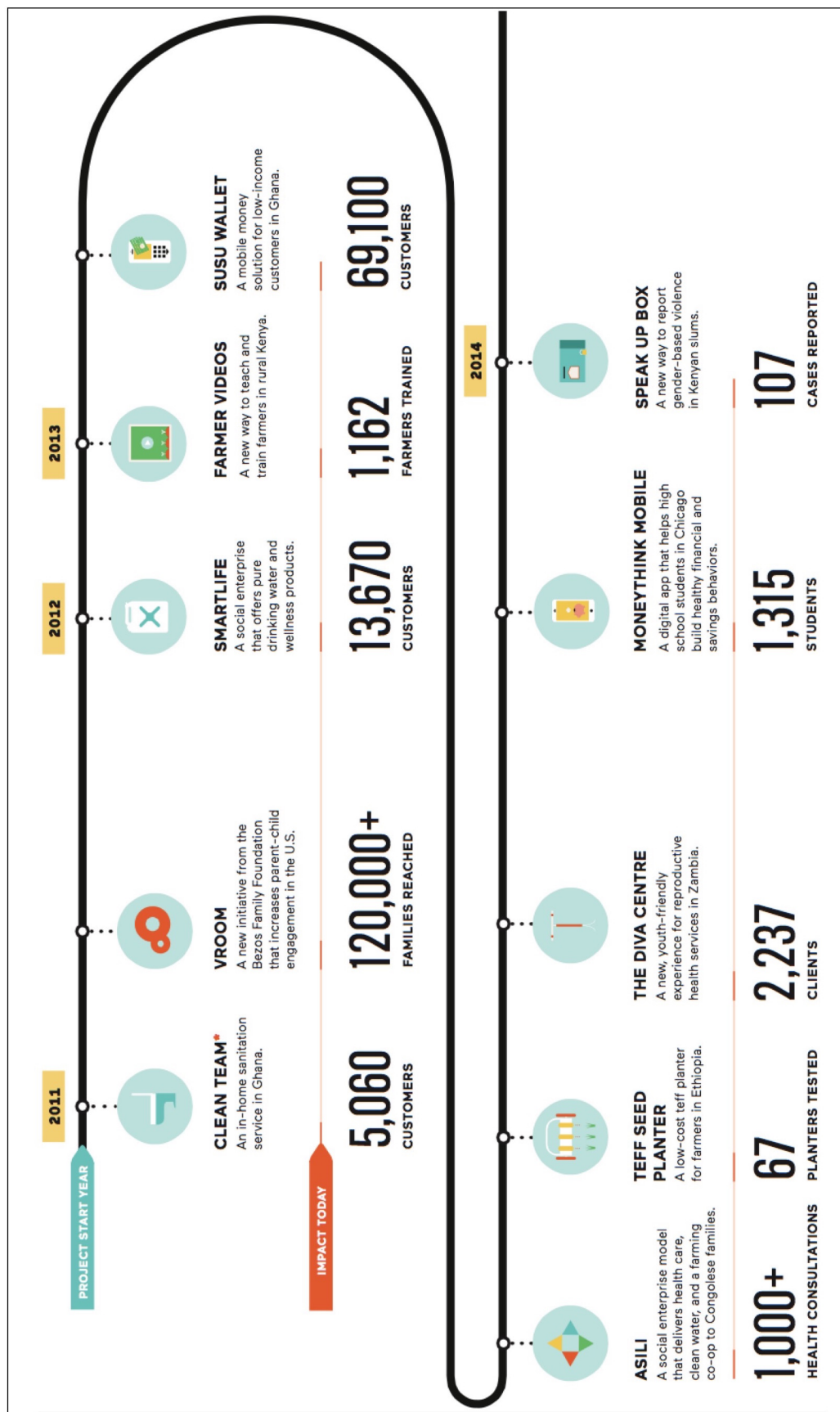
Figure 1.4 IDEO.org's impact as of November 2015 (IDEO.org, 2015c, pp. 24–25)

Table 1.2. Anecdotal evidence collected by IDIN about the influence of IDDS on participants

Name	Summit	Before IDDS	Self-Reports of Changed Beliefs and Personal Transformations	Influence of the IDDS Experience
Betty Ikalany	Tanzania 2014	Betty was the founder and CEO of the Teso Women Development Initiatives. She had been a social worker for about 10 years before attending IDDS.	"I think I'm an innovator and so should everyone else. In each of us, we have great ideas that we have not explored, most times because we think we are not fit to be innovators. Before I attended [the design summit], I did not know that I am an innovator. I had never come to realize that what I was doing was innovation in itself." – Betty Ikalany (as quoted in McKown 2014c)	Betty and her team designed an innovation toolkit to help local school leaders with information to implement innovation curricula in the school. The toolkit includes guidelines for how to build several low-cost, but practical products built by other IDIN Network members and relevant to the problems faced by the community.
Wilio Albuquerque	Brazil 2012	Wilio was studying design before attending IDDS.	"There are two things that changed my life completely: one was when I discovered design and the second was when I found out about IDDS." – Wilio Albuquerque (as quoted in McKown, 2014b) Wilio's IDDS project was a brick-making machine. After IDDS, he started a business marketing a brick press as a tool for building affordable homes around the world.	At IDDS, Wilio learned that "everyone, everywhere has potential to make his or her mark on the world" (as quoted in McKown, 2014b). He said, "I believe the potential exists within each of us. The potential appears when there is something that motivates you." (as quoted in McKown, 2014b)
Marc Mate	Zambia 2013	Marc worked at a government office that commercializes and expands technology use in Zambia.	"I believe so much in the IDIN approach to development. Involving local communities in design is key to helping African communities rise above social and economic challenges. [...] At the end of the day, this approach is going to change the way we think about and practice international development." – Marc Mate (as quoted in McKown, 2014a)	Marc visited MIT D-Lab for two weeks to work closely with the IDIN core team in developing a work plan to support and grow the IDIN Network in Zambia (McKown, 2014a).
Raúl Muñoz Sifuentes	Tanzania 2014	Raúl was an industrial engineering professor before attending IDDS.	Even before the end of the IDDS summit, Raúl was certain that the IDDS philosophy was something he wanted to take back to his students in Peru (McKown, 2015b).	Raúl started teaching a course in Peru, called "D-Lab: Lab of Development and Inclusive Innovation," which was inspired by IDDS (McKown, 2015b).
Juliet Wanyiri	Brazil 2012	Juliet was an engineering student before attending IDDS.	"IDDS helped me figure out exactly what I wanted to do, and corporate engineering wasn't it." – Juliet Wanyiri (as quoted in McKown, 2015c)	Juliet founded Foondi, a design education company, which teaches design through workshops based on the IDDS curriculum (McKown, 2015c).
Miho Kitagawa	Brazil 2012	Miho was a mechanical engineering student before attending IDDS.	"I could really tell the difference of how I look and think about things, before and after IDDS. I wanted more people to experience this change, so I started SoHub in Japan." – Miho Kitagawa (as quoted in McKown, 2015c)	Miho launched SoHub, a community empowerment project that engaged Japanese professionals, students, and local residents in the design process (McKown, 2015c).
Noela Byabachwezi	Ghana 2011	Noela was a mechanical engineer before attending IDDS.	"Since [IDDS], I have been an ambassador of co-creation and the IDDS spirit." – Noela Byabachwezi (as quoted in McKown, 2015c)	Noela works as a local Creative Capacity Building instructor at a government technology center in Tanzania. She is helping to spread the IDDS approach to design and development (McKown, 2015c).
David Saleh	Zambia 2013	David was an entrepreneur before attending IDDS.	"[IDDS] is a big opportunity to show people that Colombia has many, many things to offer the world. [...] The most important thing that [Colombia] has to offer is its people. The power of those people to create innovations." – David Saleh (as quoted in McKown, 2014d)	David collaborates with local communities in Columbia and elsewhere while working on his waste-management project and beekeeping business (McKown, 2014d).
Nicola Greene	Brazil 2012	Nicola was an engineering student before attending IDDS.	"[At IDDS] I was introduced to a designer inside of me that I never knew existed before. [...] Going there was really transformative, I learned how to create. I was quite a good problem-solver, but always with a fixed-criteria problem. Then I wandered into the word of design, and the barriers fell down. I absolutely loved it." – Nicola Greene (as quoted in McKown, 2015f)	Nicola is a Sanitation Engineer for Water for People in Malawi. She also founded Grace and Green, a company producing affordable and ecological menstrual hygiene products. She received a micro-grant from IDIN, planned a large launch event, and coined a Menstrual Hygiene Day (McKown, 2015f).
Mensah Soloman	Ghana 2009	Mensah was a farmer before attending IDDS.	At IDDS, Mensah met the founder of Avani (a solar lighting company) and saw the potential of Avani's approach to solar lighting in Ghana. Mensah says, "And now, all my life, it's been lighting, lighting, lighting. [...] It's a passion that grows in you. It has been the spark of my life" (as quoted in McKown, 2015d).	Mensah received an IDIN grant to visit Avani in India and learn how to make solar products and run a solar business. Mensah launched his own business, Rural Lighting Solutions, in Ghana (McKown, 2015d).

The Creative Capacity Building Model

The International Development Innovation Network (IDIN) International Development Design Summit (IDDS) program represents a Creative Capacity Building Model, in which students and community members from developing countries learn to design appropriate technologies. IDDS is a five-week educational conference, which aims to put participants on a lifelong path dedicated to social innovation. Former IDDS participants, also known as IDIN Network members, have founded social enterprises and Creative Capacity Building programs or courses. They have also attributed changes in their beliefs about international development and their ability to design and innovate to IDDS (see Table 1.2 for some examples).

1.4 Organization of the Dissertation

I have structured this dissertation by starting with high-level overviews, and gradually delving deeper. First, I present perspectives on HCD for Social Impact as an emerging field. Then, I provide an overview of two pioneering programs aimed at achieving social impact through design: IDEO.org's Fellowship program and the International Development Innovation Network's International Development Design Summit (IDDS). Next, I describe IDEO.org's and IDIN's strategic challenge of striving to achieve a multifaceted mission of design education and design practice with a single program. I bring to life the strategies used by IDEO.org and IDIN to address this dilemma, and describe the evolution of IDEO.org's Fellowship program and IDDS. Next, I present a comparison of the HCD process used by IDEO.org and IDDS to demonstrate that HCD is a dynamic process that is adapted to the context in which it is practiced. Then, I present a case study of an IDEO.org project and a case study of an IDDS project to further illustrate in detail how differently the HCD process can be practiced. Finally, I conclude with a summary of the major findings from this study and suggestions for future research. What follows is a synopsis of each chapter:

- **Chapter 2** presents my research question, methods, and data sources.
- **Chapter 3** provides an overview of the Social Blueprint framework, and how it can be used to analyze the strategic fit of a mission and program's structure. I present Social Blueprints to describe the structure of IDEO.org's Fellowship program and the International Development Design Summit (IDDS) program. Both programs faced challenges in trying to achieve impact through design practice and education with a single program, and represent two different strategic approaches to addressing those challenges.
- **Chapter 4** describes the evolution of IDEO.org's Fellowship program, and the decision to discontinue the Fellowship and launch new programs with more focused missions that address design practice or design education separately.
- **Chapter 5** describes the evolution of the IDDS program, and its integration into IDIN's Social Innovation Ecosystem of resources and programs that synergistically support IDIN's multifaceted mission. I also present hypotheses about the mechanisms through which IDDS inspires people to work in social innovation and discuss considerations for creating a service learning design program.
- **Chapter 6** provides a broad overview of the HCD process as it is taught and practiced by IDEO.org and IDDS. I highlight the differences in IDEO.org and IDDS's design processes to demonstrate that HCD is not static process, but rather one that is adapted to the context of the people and projects involved.

- **Chapter 7** delves deeper into case studies of an IDEO.org project and an IDDS project. This in-depth analysis illustrates in detail how differently HCD may be practiced. Based on key informant interviews with design team members from each of the projects, I present hypotheses about factors that influence the likelihood of project success.
- **Chapter 8** summarizes the major findings: 1) It is challenging for a single program to produce social innovators as well as scalable innovations. 2) The HCD process is not a rigid process. Several aspects of the HCD process are influenced by organizational mission. I conclude by presenting possible directions for future research.

Chapter 2

Research Questions and Methodology

2.1 Research Questions

This dissertation aims to contribute towards answering the following research questions:
- How are IDEO.org's Project-Based Consulting Model and IDDS's Creative Capacity Building Model different? Why are these differences important?
- What challenges are associated with having a multifaceted mission of achieving impact through design education and design practice? How did IDEO.org and IDDS evolve to address these strategic challenges?
- How might the HCD process be influenced by organizational context (e.g., mission, business model, values)?
- What factors might influence the advancement of projects from the design stage to the pilot stage?

2.2 Research Methods

In order to bridge the gap between research and practice, I conducted an empirical exploratory study of two programs with dual goals of achieving impact through design education and design practice. The programs were deliberately chosen to offer contrasting perspectives (Yin, 2008, p. 61) since there is greater potential to learn from two different contexts than from similar ones. Furthermore, the two organizations implementing these programs were pioneers in HCD for Social Impact and are highly regarded in their respective fields.

The case study research method is the most appropriate for addressing my research questions for several reasons. According to Yin's *Case Study Research* textbook (2008), case studies have a distinct advantage when
- asking 'how' or 'why' exploratory or explanatory questions,
- seeking an in-depth understanding of contemporary phenomenon, or
- real-life context is important.

An exploratory study is best suited for situations in which the "existing knowledge base may be poor, and the available literature will provide no conceptual framework or hypotheses of note" (Yin, 2008, p. 37). The goal of an exploratory study is "to develop pertinent hypotheses and

propositions for further inquiry," (Yin, 2008, p. 9) that is, to help find a research focus when the understanding is still insufficient or lacking.

HCD for Social Impact is a nascent research field with a clear need for exploratory research to develop pertinent hypotheses and theories for future inquiry. My questions focus on gaining an in-depth understanding of phenomena for which the context is critically important. Other methods, such as surveys and experiments, are not as conducive for analyzing the complexity of factors and mechanisms that are likely to be influencing HCD approaches.

2.3 Data Sources

This exploratory study consists of a qualitative analysis of documents, participant observations, and interviews (see Table 2.1 for a summary of data sources). The methodological tradition of grounded theory is the foundation for this analysis. Grounded theory emphasizes inductive theory-generation, based on iterative rounds of data categorization or coding, interspersed with synthetic analysis and purposeful recruitment of further participants in order to clarify and refine specific themes (Charmaz & Belgrave, 2003; Corbin & Strauss, 1990; Strauss & Corbin, 1994).

Table 2.1. Data sources for the analysis of IDEO.org and the International Development Design Summit

	IDEO.org	**International Development Design Summit**
Participant Observation	4 projects as design team member (9 months full time)	4 projects as design team member 1 project as design facilitator (~5 months full-time)
Document Analysis	• Final project reports • Design project blog entries • HCD Toolkit and Field Guide to HCD • Published articles • Videos of public presentations	• IDDS Design Workbook • IDDS Design Facilitator Training Materials • IDIN and IDDS blog entries • Published articles • Videos of public presentations
Key Informant Interviews	*4 total* • 2 IDEO.org Staff Members • 2 Former IDEO.org Fellows	*7 total* • 1 Faculty Member • 3 Staff Members • 3 Former Organizers and Participants

The duality of being "independent from, but familiar with" the unit of analysis is a key characteristic of being an "embedded researcher" (Lewis & Russell, 2011, p. 400). I developed *familiarity* with the organizations, programs, and projects included in this research study through former employment or volunteer experiences. As I am no longer employed by or volunteering for these organizations, I am also *independent* from these organizations.

In 2011 and 2012, I was a member of the inaugural IDEO.org Fellowship class. In 2007, 2008, 2009, 2010, and 2012, I served various roles as an organizer, participant, and design facilitator for IDDS. I also worked on design teams on four projects with IDEO.org and five projects with IDDS. The projects included work in water, sanitation, and energy in Africa and Asia. The deliverables included functional prototypes, business models, and a brand strategy.

In addition to conducting an analysis at the organizational and programmatic level, I also conducted in-depth analyses of an IDEO.org project and an IDDS project. IDEO.org's SmartLife project focused on designing a scalable business providing clean water alongside nutrition and hygiene products. The field location was Nairobi, Kenya. IDDS's Zimba project focused on designing a device to automatically chlorinate water in villages. The field locations were various villages near Kumasi, Ghana and Kolkata, India. As a design team member for both SmartLife and Zimba, I contributed towards user research, design, and prototyping activities.

In my role as a participant observer, I participated fully in all activities and responsibilities associated with my various roles with IDEO.org and IDDS. The Executive Director and Creative Director of IDEO.org, and the core faculty of IDDS were aware of my research interests. Since it was impractical to obtain informed consent from everyone encountered during participant observation, I am not using my observation notes as data. My experience as a participant observer helped me gain a familiarity with these organizations and programs that was useful in developing interview guides and interpreting data from the interview and document analysis. This practice is in line with guidelines for embedded researchers (Lewis & Russell, 2011).

The primary sources of data for this research study were semi-structured key informant interviews. I conducted 11 key informant interviews, each lasting about one hour. All the key informants were employees or volunteers previously or currently working with the organizations in this research study. Of the eleven key informants, seven were female and four were male. The educational backgrounds of the key informants ranged from bachelor's degree holders to doctoral degree holders. All interviews were audio-recorded and transcribed. I coded each interview transcription, and continuously identified and refined emerging themes throughout the research process. In this dissertation, interview data is cited by noting the role of the interviewee with respect to the organizations being studied (e.g., IDEO.org Staff, IDDS Faculty, etc.) or a unique code for each subject (e.g., S1, S2, S3, etc.).

To gain additional verification of the emerging themes, I conducted document analyses of various publicly available materials (e.g., project reports, presentations, education materials, etc.). To improve construct validity, I provided opportunities for study participants and key stakeholders to review drafts of the case study report to corroborate facts and evidence (Yin, 2008, p. 182). Study participants and key stakeholders from IDEO.org and IDDS reviewed drafts for accuracy of facts and to offer alternative interpretations of the analysis.

The next chapter will provide an overview of IDEO.org's Fellowship program and the International Development Innovation Network (IDIN) International Development Design Summit (IDDS) program.

Chapter 3

The Social Blueprint: A Framework for

Analyzing Strategic Fit

3.1 Chapter Overview

This chapter characterizes two approaches for achieving social impact through design education and design practice. I selected IDEO.org's Fellowship program and the International Development Innovation Network (IDIN) International Development Design Summit (IDDS) program as case studies because IDEO.org and IDIN are pioneering organizations that have earned high regard and influence within the design industry, social sector, and academia. In addition, I had access to data as a participant observer in both programs.

In this chapter, I present an overview of the Social Blueprint framework (Calderon, 2014b), and use it to characterize IDEO.org's Fellowship program and IDIN's IDDS program. I describe the mission and structure of IDEO.org's Fellowship program in its first year (2011-2012), as well as the mission and structure of IDIN's International Development Design Summit (IDDS) program in its first year co-creating with communities (2009).

3.2 Social Blueprint Framework

The Social Blueprint framework (Calderon, 2014b) is based on the Business Model Canvas introduced by Alexander Osterwalder and Yves Pigneur, in their book "Business Model Generation" (Osterwalder & Pigneur, 2009). Whereas the Business Canvas was created for traditional commercial enterprise development, the Social Blueprint is modified to specifically support the development of social ventures. Commercial businesses are typically driven by a need to maximize profitability. Social ventures are driven by a mix of profitability and social impact. At the pinnacle of the Social Blueprint framework is the Anchor Purpose, which is the long-term mission of the organization (Calderon, 2014b).

Anchor Purpose				
Key Partners	Key Activities	Value Proposition	~~Customer relationships~~ Stakeholder relationships	~~Customers~~ Stakeholders
	Key Resources		Channels	
Cost Structure		Revenue Streams		
Differentiation		Magnitude		

Figure 3.1. The Social Blueprint framework (Calderon, 2014b, p. 6) with Business Model Canvas (Osterwalder & Pigneur, 2009, p. 44) building blocks titles crossed out, and the new Social Blueprint building block titles highlight

The Social Blueprint framework consists of eleven building blocks that should be in alignment with one another as well as the Anchor Purpose (Calderon, 2014b). Nine of the Social Blueprint building blocks are the same as those in the Business Model Canvas (see Figure 3.1). The Social Blueprint adds the "Magnitude" building block to articulate the potential size and urgency of the social impact as well as the potential economic size of the business (Calderon, 2014b). The "Differentiation" building block was also added to reflect the competitive advantages of the organization, program, or individual building blocks (Calderon, 2014b). Another key difference between the Business Canvas and the Social Blueprint is the shift from Customers and Customer Relationships to Stakeholders and Stakeholder Relationships. Reframing these building blocks to acknowledge the importance of multiple stakeholders enables profiling of clients, beneficiaries, and employees and the corresponding Value Propositions that serve them (Calderon, 2014b). What follows is a description of each of the building blocks of the Social Blueprint.

Anchor Purpose
The **Anchor Purpose** is the mission of the program.

The Business Case
The right-hand side of the Social Blueprint is the Business Case pillar, which articulates the need and circumstances for an organization or program to develop or grow (Calderon, 2014b). The underlying building blocks of the Business Case pillar are as follows:
- **Value Propositions** are the value the program is providing to address the needs of the main stakeholders.
- **Stakeholders** are individuals or groups for whom the program offers value propositions. Stakeholders may include customers (who pay for the value the program delivers), beneficiaries (who benefit through the impact of the program), and funders (who provide funding). They are ranked based on how strongly their needs or interests influence the design of the program.
- **Stakeholder Relationships** describe the ways that the program interacts with each Stakeholder.
- **Channel** describes how the program will interface with the customers and/or beneficiaries.
- **Revenue Streams** describe the program's economic income streams.
- **Magnitude** describes the economic and impact opportunities, and how much the organization or program can capture or address.

The Root Strategy

The left-hand side of the Social Blueprint is the Root Strategy pillar, which outlines the fundamental operational elements needed to make an organization or program successful (Calderon, 2014b). The underlying building blocks of the Root Strategy pillar are as follows:

- **Key Partners** are individuals or organizations that are instrumental to starting and/or growing the program, although they may not directly influence the design of the program.
- **Key Activities** are the activities and processes needed to design, launch, provide and support the program's offering(s).
- **Key Resources** are people, places or things that are necessary for the program to be successful. Key Resources might include founders and employees who produce the value the program delivers. Key Resources are required to execute the Key Activities.
- **Costs** are the expenses that significantly affect the design of the organization or program, and are generally driven by the Key Activities and Resources.
- **Differentiation** refers to attributes that make the organization or program unique, and maintain competitive advantage.

An alternative way to understand the Social Blueprint framework is through the following lenses: defining value with the Anchor Purpose and Value Propositions; creating value with Key Partners, Key Activities, and Key Resources; delivering value to Stakeholders with Stakeholder Relationships and Channels; and capturing value through alignment of Differentiation, Costs, Revenue Streams, and Magnitude (see Figure 3.2).
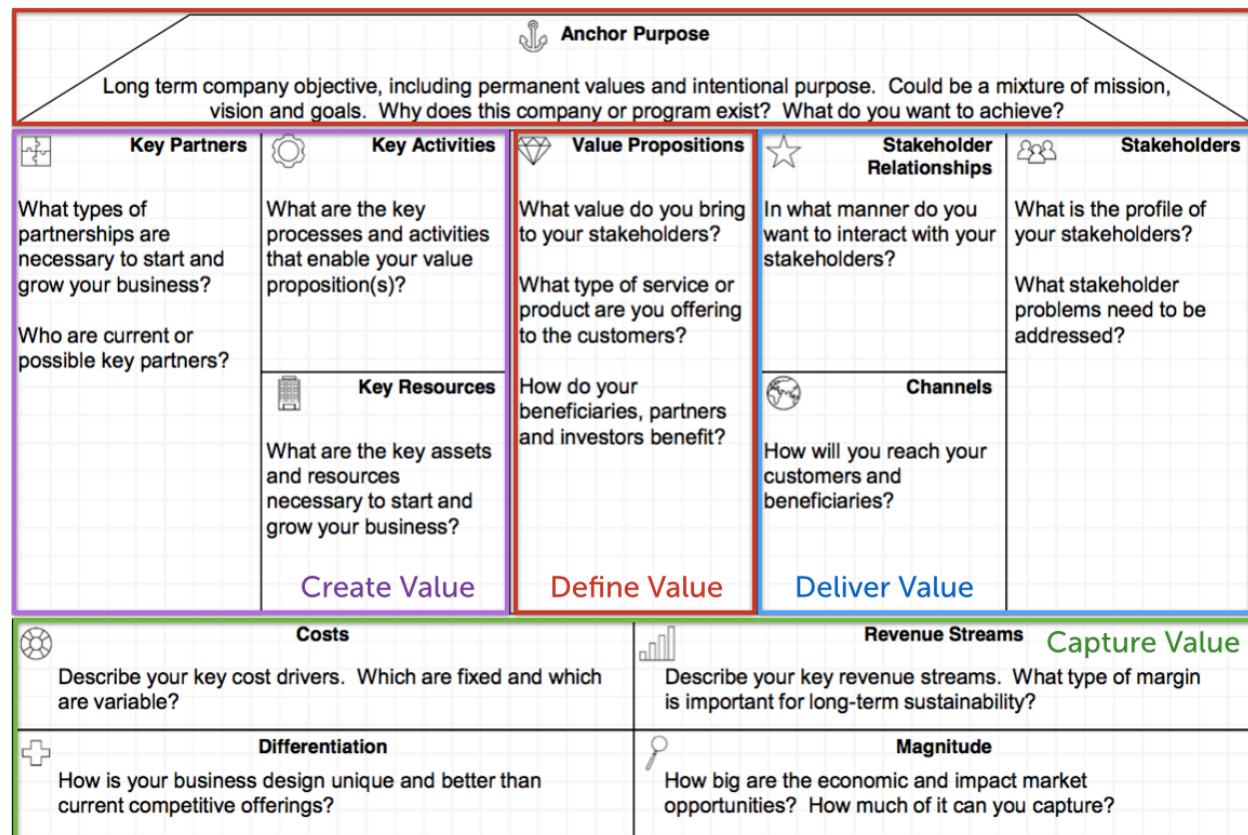
Figure 3.2. Social Blueprint building blocks grouped to define, create, deliver, and capture value, adapted from (Calderon, 2014b, p. 10)

3.3 Social Blueprint for IDEO.org's Fellowship Program

IDEO, an award-winning global design firm, is widely renowned for popularizing HCD. For years, IDEO had been working on social sector challenges. In 2011, two former leaders of IDEO's Social Innovation Domain founded IDEO.org as an independent nonprofit organization to address issues of poverty through design. What follows is an overview of IDEO.org's business model using the Social Blueprint framework (see Figure 3.3).

Anchor Purpose

IDEO.org had a multifaceted mission of achieving impact through design practice as well as design education. IDEO.org's Anchor Purpose or mission was to achieve measurable impact by addressing issues of poverty through HCD, and to "foster a community of future leaders with expertise in the methods and approaches of design thinking" (IDEO.org, 2012b, p. 6).

The Business Case for IDEO.org

IDEO.org had two main offerings: 1) a one-year Fellowship program for designers with an interest in social impact and social sector leaders with an interest in design, and 2) HCD consulting services for nonprofits, foundations, for-profit social enterprises, and corporations that have social impact interests.

IDEO.org's Fellowship program was a one-year apprenticeship in which social sector leaders learned design by working on design projects with IDEO designers. It was a rare opportunity for social sector leaders to learn the HCD mindset with hands-on experience and personal guidance from IDEO designers. The Fellowship program was also a unique opportunity for IDEO designers to try working in the social sector, with the security of returning to IDEO after the one-year Fellowship.

Through HCD consulting services, IDEO.org aimed to enhance the ability of client organizations to innovate and achieve impact. Design teams of Fellows created innovative products, services, and programs across a variety or project sectors, such as water, sanitation, agriculture, health, financial services, gender equity, and community building. As a consultancy, IDEO.org did not implement these concepts, but instead partnered with client organizations that work directly with low-income individuals and communities in the United States and developing countries. To help clients embrace HCD and increase buy-in for the concepts generated, IDEO.org design teams involved clients in the design process.

Anchor Purpose
Design Practice: To achieve measurable impact by addressing issues of poverty through HCD
Design Education: To "foster a community of future leaders with expertise in the methods and approaches of design thinking" (IDEO.org, 2012a, p. 6)

Key Partners	Key Activities	Value Proposition	Stakeholder relationships	Stakeholders
Parent organization: IDEO Funders: Philanthropists, foundations, etc.	Partnership management HCD consulting services through design projects Teaching HCD mindset to Fellows **Key Resources** Founders were the former leaders of IDEO's Social Innovation domain, and were uniquely positioned to gain support from IDEO Fellows as design team members	Project-Based Consulting Model: Delivers innovative concepts and implementation plans to help *clients* achieve their goals Enables *designers* to create social impact through HCD Improves quality of life for *beneficiaries* through innovative products, services, or programs 1-year Fellowship: Enables *designers* to work in the social sector, with the security of returning to IDEO afterwards Enables *social sector leaders* to learn the HCD mindset while achieving impact	*Designers* brought *clients* along on projects to help them embrace HCD **Channels** IDEO.org's partnership team connects with clients through word-of-mouth in their professional network, internet, email, and in-person interactions IDEO.org is not an implementer, and instead has indirect channels through partner organizations that work directly with *beneficiaries*	*Beneficiaries* are low-income individuals who benefit from products, services, and programs *Clients* are nonprofits, foundations, social enterprises, and corporations with impact interests *Designers* with an interest in social impact *Social sector leaders* with an interest in design

Cost	Revenue Streams
HCD project costs	Fee-for-service for HCD projects Project-specific grants
Fellowship program	Unrestricted philanthropic contributions

Differentiation	Magnitude
IDEO's support (strong brand, network of donors and clients, expert design coaches, prototyping facilities, internal database of exemplary projects, etc.)	Water, sanitation, agriculture, health, financial services, gender equity, and community building

Figure 3.3. Social Blueprint of IDEO.org's Project-Based Consulting model and the Fellowship program in its first year (2011-2012)

An important motivation for founding IDEO.org as a nonprofit was to make HCD consulting services more affordable for social sector clients:

> In the recession of 2008 and 2009, foundations lost up to 40% of their endowments. There was so much desire within social enterprises and nonprofits to work with us, and so much desire amongst the designers to work on these projects, but there was really a question of funding. So we started to ask, "How might we approach this differently? What might a different kind of business model look like?" — Jocelyn Wyatt, IDEO.org's Executive Director (as quoted in Pastorek, 2013)

> [Starting IDEO.org as a nonprofit] really came from the fact that we wanted to be able to do work at a scale that we couldn't do inside of IDEO. There are such fantastic nonprofits and social enterprises and foundations that are doing amazing work and we wanted to be able to reach them. And if we stayed inside of IDEO, we couldn't grow in the way we thought the market would allow us to if we were outside. So we essentially did a design project on ourselves, and arrived at the fact that, if we became a 501(c)(3) nonprofit that would sit alongside of IDEO, it would allow us to really streamline the organization, build off the infrastructure that we could use from IDEO and receive philanthropic contributions. And this really started as an investigation that was more from a financial perspective, like how do we get ourselves to be affordable? — Patrice Martin, IDEO.org's Creative Director (Martin, 2012)

IDEO.org's innovative business model enabled them to reduce costs for clients, and to select projects based on their potential for impact:

> IDEO provided substantial seed funding to establish IDEO.org. Now, as a separate 501(c)(3) nonprofit, IDEO.org relies on fees for service and philanthropic support to cover our costs. We ask the nonprofit partners we work with to pay the direct costs for our work with them. And we raise money through fundraising to cover our indirect costs, which includes our Fellowship Program and our storytelling and knowledge sharing efforts. By raising philanthropic capital, we are able to select the projects we undertake based on their potential for impact. — (IDEO.org, 2012b, p. 14)

In IDEO.org's first year, it raised $900,000 in philanthropic contributions, and $1,600,000 in project revenues from clients (IDEO.org, 2012c, p. 7).

The Root Strategy for IDEO.org

A significant portion of IDEO.org's Root Strategy was influenced by the partnership with IDEO. Born out of IDEO, IDEO.org naturally adopted IDEO's Project-Based Consulting Model and HCD process. Furthermore, as leaders of IDEO's Social Innovation Domain, the founders of IDEO.org were uniquely positioned to gain IDEO's support and partnership. IDEO.org has cultivated a strong reciprocal relationship with IDEO:

> We created IDEO.org as a separate 501(c)(3) company out of IDEO, but with many ties between the two organizations so we have talent that flows from IDEO to IDEO.org on rotation or on a project-by-project basis. Three of our nine board members at IDEO.org currently work at IDEO. When we started in San Francisco, we shared space with IDEO. We now have our own space across the street but we go back and forth frequently between the two. So the organizations have remained really tightly tied because there's so much going and so much overlap. People within IDEO do really have a deep commitment to supporting poverty related challenges and want to be connected with the work of IDEO.org. — Jocelyn Wyatt, Executive Director of IDEO.org (as quoted in Skillbridge, 2015)

> We've really benefitted, obviously, from being housed within IDEO. Because we [IDEO.org] get inspired by the amazing stuff going on there all the time. But it's been cool for us to see how the ways in which we're acting differently as an organization and things that we're learning from (being on the edge of the work) has also changed the way the [IDEO] firm is responding. And the way in which they're modeling

some of their projects and actions. — Patrice Martin, IDEO.org's Creative Director (Martin, 2012)

Our connection to IDEO is probably paramount [as a competitive advantage]. The fact that we're able to go over to their space, hear their project shares, borrow their talent on our team, have them come over and do design crits [critiques] with us; all of that is incredibly helpful. We have amazing IDEO partners: Tim Brown on our board and our advisory board. So I think having them really entrenched in the problems and successes is both feeding us but also feeding IDEO. That's a pretty great reciprocal relationship. — IDEO.org Staff (S16)

IDEO is a critical source of Differentiation; it has provided substantial seed funding to launch IDEO.org (IDEO.org, 2012b, p. 14), and several of IDEO.org's donors are from IDEO and its network (IDEO.org, 2012a). Moreover, research suggests that "networked reputation" or the "firm's reputation within a network of business relations represents a key factor of competitiveness for consulting firms" (Glückler & Armbrüster, 2003, p. 271). IDEO.org has been able to leverage IDEO's strong brand and professional network to attract some of the largest and most influential foundations, corporations, non-profits, and government agencies (e.g., Bill and Melinda Gates Foundation, Rockefeller Foundation, Unilever, Mercy Corps, and USAID) as clients. These organizations have the expertise and resources to implement IDEO.org's innovative solutions.

The design and domain expertise of IDEO.org's design teams are Key Resources that enable IDEO.org to produce exemplary designs with high potential for measurable impact. Ample funding combined with the prestige of IDEO's brand also enabled IDEO.org to recruit "top-notch designers, an elite class of businesspeople, and development experts" (IDEO.org, 2014a). In addition, IDEO's Design Directors and Senior Project Leads serve as design coaches and reviewers for IDEO.org design teams and projects. IDEO.org also has access to IDEO's technicians and prototyping facilities (e.g., 3D printer or computer numerical control milling). IDEO's professional network is a source of expert guidance on domain subjects. IDEO.org teams also draw inspiration and insights from exemplary projects archived in IDEO's Tube, an internal knowledge management system. These shared resources contribute towards IDEO.org's success in creating exemplary designs.

3.4 Social Blueprint for the IDDS Program

According to Amy Smith, the Director of IDDS, "Nearly 90 percent of research and development dollars are spent on creating technologies that serve the wealthiest 10 percent of the world's population. The point of the design revolution is to switch that. There are several different places where that revolution has to take place. We started thinking, 'How do we train engineers so they might start thinking of this as a field of engineering they'd want to pursue?'" (as quoted in Revkin, 2007, p. 2). The International Development Design Summit (IDDS) was launched in 2007 as part of a design revolution to shift the balance towards tackling challenges facing the world's poorest populations. IDDS is a "hands-on design experience that brings together people from all over the world and all walks of life to create technologies and enterprises that improve the lives of people living in poverty" (IDDS, 2013).

IDDS is a five-week conference that provides participants with training in the design process, entrepreneurship, and international development. IDDS conferences are typically hosted at a university near low-income communities in developing countries. Participants are organized into teams that collaborate with local communities and craftspeople on various projects to

address challenges of poverty with technological solutions. By the end of the IDDS conference, each team is expected to produce a prototype. After the conference ends, IDDS hopes that participants and community members will continue innovating and working towards positive change in the world. For example, some participants or community members might choose to further develop IDDS prototypes into products, and launch social enterprises. What follows is an overview of IDDS's business model using the Social Blueprint framework (see Figure 3.4).

Anchor Purpose

IDDS has a multifaceted mission of achieving impact through design practice as well as design education. IDDS's Anchor Purpose or mission is to build capacity for technology creation in developing countries, and to create technologies for poverty alleviation. IDDS has found that learning design and co-creating technology for poverty alleviation with people from all over the world and all walks of life can be a transformative experience. IDDS participants have self-reported that IDDS inspired them to create positive change in the world (IDDS faculty, S2).

IDDS's Anchor Purpose was driven by a vision of the Founder and Director of IDDS. She believes that building capacity for technology creation in developing countries is critical for sustainable development. An important principle of IDDS is that impact is not just a result of the products of innovation, but that impact happens through participation in the innovation process (Smith, 2015a):

> There are a lot of steps that go into taking an idea and creating it into a solution, then taking that solution and implementing it in the field and finding ways to scale it up and seeing impact. However, I believe that impact happens throughout that process. It is not only the product of innovation that has impact; it is also the process of innovation. That speaks to why we think IDDS is the way to do development because everyone at IDDS goes through the process of innovation to get to the products of innovation. — Director of IDDS (Smith, 2015a)

The Root Strategy for IDDS

IDDS's Key Resources are human resources. The Director of IDDS has strong connections with the Massachusetts Institute of Technology (MIT); she was the daughter of an MIT professor, graduated from MIT with a bachelors and masters degree in mechanical engineering, and founded the MIT D-lab. Her long history of connections with MIT positioned the Director of IDDS to gain support from MIT (a Key Partner), and develop a strong network of alumni, students, and other educators. The Director's charisma and vision for IDDS inspired people in her network to volunteer and offer in-kind support to organize IDDS. IDDS instructors have expertise teaching design, engineering, and international development at world-class universities. These instructors, professionals, and students who volunteer to organize IDDS are Key Resources that enable IDDS to continue operations with limited funding.

IDDS instructors have developed the IDDS curriculum to teach the HCD process through project-based learning (integrating lectures, prototyping exercises, mentorship, and hands-on projects). These Key Activities are intended to build capacity for technology creation and to create technologies for poverty alleviation. In addition, IDDS carefully orchestrates community-building activities (e.g., an international potluck, a talent show, opportunities for participants to give presentations about themselves or their work, a daily ritual of starting the morning together, etc.). These community-building activities are important for catalyzing bonds between participants, and strengthening the network of IDDS alumni who will support each other in continuing to work in social innovation.

Anchor Purpose

Design Education: To build capacity for technology creation in developing countries
Design Practice: To create technology for poverty alleviation

Key Partners	Key Activities / Key Resources	Value Proposition	Stakeholder relationships / Channels	Stakeholders
MIT and other universities that host IDDS conferences	**Key Activities** Teaching and practicing HCD Project-Based Learning model Community building activities **Key Resources** IDDS Director has strong connections to MIT and a network of alumni, students, and other educators Instructors have expertise teaching design, engineering, and international development at top-ranked universities IDDS *organizers* are volunteers	**Value Proposition** 5-week conference and HCD projects: Build *participants'* capacity to create technology for poverty alleviation HCD projects have potential to improve quality of life in *partner communities* *Organizers* want to help realize IDDS's mission and catalyze a transformation in *participants*	**Stakeholder relationships** *Participants* and *organizers* have strong social bonds with one another, and are considered part of the IDDS family or tribe. *Participants* develop relationships with people in *partner communities* to co-create technologies **Channels** IDDS recruits *participants* through the internet and existing design and development courses or programs at partner universities IDDS develops relationships with *partner communities* through host universities IDDS is not an implementer, and instead supports *participants* in developing technologies and social enterprises to serve *beneficiaries*	**Stakeholders** *Participants* are interested in learning about or delving deeper into design, entrepreneurship, and international development Most IDDS *organizers* were former participants *Partner communities* are low-income villages or urban areas that collaborate with IDDS on projects *Beneficiaries* are low-income individuals who benefit from products, services, and programs

Cost	Revenue Streams
IDDS conferences (e.g., travel expenses, health insurance, materials, etc.)	Small grants (from foundations, nonprofits, etc.) for each IDDS conference

Differentiation	Magnitude
IDDS brings people from all over the world and all walks of life to live together and create technologies to address issues of poverty	Annual conference on broad topics (e.g., agriculture, health, and education)

Figure 3.4. 2009 Social Blueprint of the IDDS program

The Business Case for the International Development Design Summit (IDDS)

IDDS brings people from all over the world and all walks of life to live together and create technologies to address issues of poverty (Differentiation). IDDS intentionally recruits people who do not identify as innovators or designers, and builds their confidence and capacity to be creative:

> What is different about IDDS is that we tend to catch people at the very beginning of the process, at the early ideas stage. We guide people into the innovation pipeline. There are a lot of programs that guide people when they are in the pipeline. IDDS is about empowering people to believe that they can have a journey through the innovation pipeline. It is a lot about that type of capacity building and confidence building to get people to where they are confident that they can think of ideas that they can reduce to practice, and implement, and have an impact. — Director of IDDS (Smith, 2015a)

Since IDDS targets people who do not already identify as innovators, participants may have little or no experience in design. About half of the participants in IDDS are undergraduate students and half are community members from low-income areas. IDDS participants are a diverse group of "students and teachers, professors and pastors, economists and engineers, masons and mechanics, doctors, welders, farmers, and community organizers" (About IDDS). The Value Proposition of IDDS for these participants is the opportunity to learn design and create technologies that will benefit the world's poor. IDDS is able to recruit students and community members as participants through their network of universities with design or international development courses or programs (Channels).

Most IDDS organizers were former IDDS participants. The Value Proposition of IDDS for organizers is the opportunity to help realize IDDS's mission, and catalyze a transformation in participants. For some organizers, volunteering to organize IDDS is an opportunity to share an experience that was valuable and transformative for them. The Stakeholder Relationship among IDDS organizers and participants is one of tribal kinship and familial bonds.

IDDS conferences are typically held at a host university in a developing country. Host universities (Key Partners) provide in-kind support and resources, such as access to lecture halls and work spaces. IDDS also develops relationships with partner communities through host universities. Each IDDS project is based in a partner community so that IDDS participants can co-create technologies with potential users and other stakeholders. The Value Proposition for low-income communities to collaborate on projects with IDDS participants is the potential for these prototypes to benefit their community. IDDS does not implement projects directly, but instead supports participants in developing technologies and social enterprises that serve beneficiaries (Channels).

Grant funding (Revenue Streams) enables IDDS to support students and people living in low-income communities to participate in and organize IDDS. Many of these participants pay out of pocket or raise their own funding to pay for travel, food, and personal expenses during IDDS. IDDS provides free accommodation and does not charge a participation fee. Scholarships are granted to participants who cannot afford to pay for their travel or food during the summit. Although some lecturers, design facilitators, or organizers may have their travel expenses covered, they do not receive any compensation for their services. The willingness of these stakeholders to pay for their own participation helps to lower the costs associated with organizing an IDDS conference.

3.5 Discussion

In this chapter, we considered the strategic fit or alignment of the Anchor Purpose with the other building blocks by analyzing IDEO.org's and IDDS's Social Blueprints. Since IDEO.org and IDDS grew out of *existing* organizations, their core competencies and the building blocks of their Root Strategy were significantly influenced by their founders and parent organizations. This is a notable difference from *new* organizations or programs, which are typically formed by starting with identifying Stakeholders and their needs (Calderon, 2014b).

Although IDEO.org's Fellowship program and IDDS had multifaceted missions aimed at achieving impact through both design practice and design education, each program was stronger in one area than the other (see Table 3.1). IDEO.org's Social Blueprint was more aligned with the design practice aspect of its Anchor Purpose: achieving measurable impact by addressing issues of poverty through HCD. IDEO.org had talented designers from IDEO (Key Resources), who were experts in the HCD process (Key Activities) and creating innovative products, services, and programs (Value Propositions). IDEO (Key Partner) was also a critical source of Differentiation; its brand and professional network drew clients that had the resources and expertise to implement innovations (Channel). IDEO.org was also able to raise significant funds for HCD projects through fee-for-service revenues, and to cover other costs with philanthropic contributions from donors (Costs and Revenue Streams).

In contrast, IDDS's Social Blueprint was more aligned with the design education aspect of its Anchor Purpose: building capacity for technology creation in developing countries. IDDS instructors have several years of experience teaching design and development courses in top-ranked universities (Differentiation). They developed a curriculum to build capacity for technology creation (Value Proposition) using a project-based learning (Key Activities) model. IDDS was able to recruit participants through existing design and development courses and developed relationships with partner communities through partner universities (Channels and Key Partnerships). IDDS raised grants to cover most of the costs of the program and provided scholarships to those in need, in order to be affordable and accessible for everyone (Costs and Revenue Streams). IDDS was able to bring people from all over the world and all walks of life to live together and create technologies to address issues of poverty; the opportunity to bond with a diverse group of people that have shared values for co-creation and social innovation is essential for building capacity for technology creation and catalyzing a personal transformation in participants (Value Propositions).

Table 3.1. Comparison of the building blocks of the Root Strategy of IDEO.org from 2010 to 2011, and IDDS in 2009

	IDEO.org	IDDS
Anchor Purpose	Prioritization of design practice (measurable impact)	Prioritization of design education (personal transformation)
Key Partners	IDEO (a world-renowned design consultancy)	MIT (a world-class engineering university)
Key Activities	• Project-based consulting • Expert-led HCD process • Client or partnership management	• Project-based learning • Co-creation HCD process • Community building
Key Resources	Design teams composed of expert designers from IDEO (a world-renowned design consultancy) and social sector professionals	Educators who teach design and development courses at world-class engineering universities
Differentiation	IDEO's support (strong brand, network of donors and clients, expert design coaches, prototyping facilities, internal database of exemplary projects, etc.)	IDDS was able to bring people from all over the world and various walks of life to live together and create technologies to address issues of poverty

IDEO.org and IDIN had multifaceted missions aimed at achieving impact through design education and design practice. Although they faced similar strategic dilemmas of trying to align their program structures with a multifaceted mission, they took different strategic paths. IDEO.org shifted from offering a single program with a multifaceted mission to offering multiple programs, each with a more focused mission. IDEO.org prioritized design practice and it became clear that it could achieve the goal of measurable impact without the design education aspect of its mission. IDEO.org had distinct offerings, and could continue to offer HCD consulting services and create products, services, and programs that achieve measurable impact, even without the Fellowship program. In Chapter 4, I will describe the evolution of IDEO.org's Fellowship program and the development of distinct programs that focus on either design education or design practice.

IDIN is in the process of shifting the structure of its IDDS program and integrating it with other programs and resources to better address a multifaceted mission. IDDS prioritizes design education, but its philosophy of teaching and personal transformation is integrally linked to design practice. IDDS believes that experiences during the five-week conference along with experiences related to the HCD projects are both critical for personal transformation. IDDS participants must believe that they are working on real development projects with potential for impact in order for personal transformation to occur. IDIN decided to maintain its multifaceted mission, and developed several other programs and resources to better support both aspects of the mission. In Chapter 5, I will describe the evolution of IDDS and the development of new programs and resources to support its multifaceted mission.

Chapter 4

The Evolution of IDEO.org

4.1 Chapter Overview

By describing the evolution of IDEO.org and IDDS, my goal is to identify the challenges associated with having a multifaceted mission of achieving impact through both design education and design practice. Moreover, I hope that other practitioners developing or managing HCD for Social Impact programs will be able to learn from these case studies to align their goals with their core competencies. The characterization of these approaches is important especially at this time when design and the social sector are converging and evolving:

> The social sector is evolving and the spaces in which you can do this kind of work [are] evolving. The field has changed quite a bit. There are a lot of different players in that space; there are a lot of different ways that you can engage it. One of the outcomes is also muddying the lines that had traditionally existed between international aid development and non-profits or organizations and community design centers and for-profit design practices. There's a lot of muddiness in the space, which is both good and bad, but I do think it's a little bit hard to figure out how to maneuver through it. It's no longer cut and dry where it's best to do this kind of work and what [are] the best models of practices. I think all of them have something to give in this situation. It'll be interesting to see how it continues to evolve. — Former IDEO.org Fellow (S17)

According to a former IDEO.org Fellow, "It's interesting to look at the evolution of IDEO.org. In some ways, [it was] really innovative and it still is. When they came out on stage, they were the first of its kind at that scale, doing those things" (S17). This chapter describes the evolution of IDEO.org with a focus on its Fellowship program. This chapter is organized in three sections: 1) the evolution of IDEO.org's Fellowship Program, 2) the shift from the Project-Based Consulting Model to the Programmatic Model, and 3) the development of distinct programs focusing on either design education or design practice.

4.2 Evolution of IDEO.org's Fellowship Program

When IDEO.org was founded in 2011, it had two main initiatives: HCD Connect and a Fellowship program. HCD Connect was an online platform on which people could share stories about human-centered design projects in the social sector. IDEO.org's Fellowship program was a one-year apprenticeship in which social sector leaders learned HCD by working on design

projects with IDEO Senior Project Leads. IDEO.org's organizational mission focuses on three pillars (design, foster, and spread):

> Through human-centered **design** projects, we aim to bring stability, hope, and dignity to communities around the globe that are wrestling with poverty. Along the way, we'll **spread** what we learn and accomplish with everyone—so we're all learning together. And through the IDEO.org Fellowship Program, we **foster** a community of future leaders with expertise in the methods and approaches of design thinking. — (IDEO.org, 2012b, p. 6)

The "design" pillar was addressed by the Fellowship program's design projects. The "foster" pillar was addressed by training social sector leaders in HCD through the Fellowship program. The "spread" pillar was addressed through IDEO.org's HCD Connect online community and through teaching and speaking engagements. See Figure 4.1 for outputs from IDEO.org's first year. IDEO.org's Co-Lead and Creative-Director elaborated upon the rationale for the three pillars:

> We [at IDEO.org] think about impact in three ways: the first is design — no surprise to anyone. But this is about partnering with organizations and saying, how can we make them more innovative and more effective? And it's been interesting for us as a learning journey to say, "Okay, we're now a nonprofit. We need to be selecting based on a challenge, based on an opportunity. First, potential for impact on the world, and leave behind our old habits of selecting clients based on revenue."
>
> We also really then said, "Okay, if what we want to do is to have design have a bigger presence here, we need to invest in the future leaders who are going to be making decisions in this space. And this resulted in our Fellowship program, where we bring designers and social sector experts together and mash them up, and have them work as one design team for a year. The intention of this is to take designers and say we want to give them exposure to the complexity and challenges of poverty so they can apply this to the way in which they work and think, and to take folks who have experience on the ground with nonprofits, and give them the know-how of what a design approach can do for these types of challenges […]
>
> And lastly, we're really committed to being open with our work. And we see ourselves as contributing to a movement that I believe we're all a part of, in how we bring design to this space in a more powerful way. So we are quite intentional about sharing all of our work. We've started a new platform called HCD Connect. Where we're hoping that designers and practitioners everywhere can be sharing tips and tricks. And advice on the ways in which they're solving problems. And just to start to say what happens with design as this movement. — Patrice Martin, IDEO.org's Creative Director (Martin, 2012)

DESIGN	FOSTER	SPREAD
Seventeen design projects completed. Eight programs in pilot and preparing for scale up.	Two classes of emerging design and global leaders in the IDEO.org one-year Fellowship Program.	17,000 community members on HCD Connect, 15,000 people reached through 75 teaching and speaking engagements.

Figure 4.1. IDEO.org's three pillars of design, foster, and spread and the outputs of 2011-2012 (IDEO.org, 2012c, p. 5)

This analysis will focus on IDEO.org's Fellowship program because it has a multifaceted mission of design education and design practice. IDEO.org's former Fellowship Lead described the Fellowship program as follows:

> The IDEO.org Global Fellowship Program enables future leaders from the business and social sectors to spend a year working full-time with experienced designers on social impact challenges around the world. From day one, Global Fellows are immersed in human-centered design and work closely with our senior designers and those with whom we work with at IDEO. Global Fellows come from incredibly diverse backgrounds, so they're also learning from one another. After four to five projects throughout the course of the Fellowship, Global Fellows are equipped to take their design thinking expertise to other parts of the social sector. — Jessie Chamberlin, Former Fellowship Lead (as quoted in Toal, 2014)

The following sections provide an overview of the major lessons learned during the evolution of IDEO.org's Fellowship program. Section 4.2.1 describes the expansion from a learning-by-doing model to include more educational opportunities. Section 4.2.2 notes changes in the criteria for selecting Fellows. Section 4.2.3 describes how the Fellowship program was reframed as an opportunity to learn the HCD mindset, rather than the craft and tools of a designer. Section 4.2.4 describes the recognition that engaging clients in design projects helped them integrate more HCD into their work. Section 4.2.5 summarizes the lessons learned from the evolution of IDEO.org's Fellowship program. These themes emerged from key informant interviews and document analysis.

4.2.1 Integrating Learning-by-Doing with Educational Opportunities

IDEO.org's Fellowship program was first launched in 2011. Through the Fellowship program, professionals from various social sector fields joined IDEO.org to learn HCD by working as design staff on consulting projects directed by Senior Project Leads from IDEO. After Fellows completed their one-year Fellowship, IDEO.org hoped these Fellows would be able to practice and disseminate HCD in the social sector. The Fellowship's educational model was essentially learning-by-doing:

> You're working and you're learning along the way. It's tough work and you're to some degree thrown into the deep end of the pool, but we work with very successful people who have full careers behind them of doing amazing work in the field. So for the most part, it hasn't been too much of a challenge because these are very ambitious people who have an appetite to learn an entirely new process and bring along some of their history and the ways they've done things in the past, but are also just excited to do things entirely on a new course. — IDEO.org Staff (S16)

In 2014, Organizational Development consultants interviewed eight to ten of the fifteen Fellows from IDEO.org's first (2011-2012) and second (2012-2013) Fellowship cohorts to obtain feedback on the Fellowship program (Murgatroyd & Whitty, 2014). Some Fellows thought the term "Fellowship" might have set up false expectations:

> The word *fellowship* is a misnomer; it suggests a supportive learning environment. The supportive learning environment came from my fellow Fellows . . . it wasn't like anyone was thinking through what the learning process was like. — IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> I think this was closer to an apprenticeship than a fellowship. […] There's a huge range of what fellowships can be and some fellowships are where you're going out and getting funded to do a job, but the idea is that there's all these other extracurricular training experiences that you're getting as part of that, to fellowships that are more independent explorations where you're being funded to do that. Technically, IDEO[.org] is more the one where you're getting funded to do a job, but there weren't a lot of extracurricular trainings that were built in and there wasn't a lot of time to pursue those kinds of things. […]
> When I say apprenticeship, you're in it; you're doing the job. Your skills that you're learning, you're learning during the job. […] For years now, I've gotten people come up to me and say, "Hey, I want to go

> work for IDEO.org, and I want to this and do that," and I'm like, "Hold up, you are project staff. They will choose the projects you're on. You can make some expression of interest but that is not a guarantee." It's easier to think of this as an apprenticeship in terms of where you're putting your expectations of how you're getting skills, and what kinds of experiences are coming in. It's not to say it's a bad thing, but I think it's very different from how some people tend to think of fellowships, which usually offer much more independent exploration possibilities or independent training mechanisms. — Former IDEO.org Fellow (S17)

In particular, Fellows noted the need for more autonomy, goal setting to improve skills, and recognition of their prior experience and skill set:

> There wasn't an opportunity to progress in the Fellowship – it's like going along for the ride. If you want to gain projects under your belt and learn methodology, great, but don't expect it to be led by you . . . If there was more equity between Global Fellows [social sector leaders] and IDEO Fellows, and some goal setting around design skills, that would help. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> IDEO.org can better support its Fellows by getting in better alignment with how to communicate up front what the Fellowship is and asking the Fellows what do you hope to do and learn . . . Getting clear about who wants to get better at what and what a realistic set of goals are. For example, I really wanted to improve [a specific skill set] and I never had a chance to do that. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> Fellows don't have much opportunity to voice things, have them heard, and have them reflected in the work. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> People outside of IDEO were expected to learn by doing the IDEO methodology and just pick it up. It was strange to never be asked, "How have you seen this done? What are your thoughts on this?" You are expected to believe in the myth or legend that is IDEO. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

An important shift for IDEO.org was recognizing that the Fellows were not only learning design, but that they were also bringing their own expertise, networks, and talents:

> It's been a challenge at first to say, "Okay. We have all these new people coming in. Now we want them to act like designers." And that felt very constricting in some ways. And what we've been able to learn is that these folks bring with them their own amazing expertise, and networks, and talents that we need to be able to leverage as an organization as a whole. Rather than just trying to fit them into specific spots. So once we kind of opened up to that possibility, great things have been happening. — Patrice Martin, IDEO.org's Creative Director (Martin, 2012)

During the first year of the Fellowship program, projects lasted from four weeks to eight weeks, and design teams sometimes had to wrap up projects while starting another. It was an intense schedule that made it challenging to find time for educational opportunities. Several Fellows expressed desire for a more intentional and supportive learning environment in addition to the Fellowship's learning-by-doing model:

> I would have loved to have more classes of examples of methodology in the field. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> I wish we had the opportunity to learn methods of design research, spend more time with case studies, failures, and various types of IDEO work, rather than feeling we were designing from scratch. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> It was so fast paced; it was hard to find time to reflect . . . If I had had some mandatory reflection time, I probably could have shifted some of the things I was doing. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

During the second year of the Fellowship, IDEO.org shifted towards longer projects lasting from ten weeks to fourteen weeks, and tried to structure in time for breaks and reflection.

The social sector leaders in the Fellowship program also expressed a need for more support in transitioning from the social sector to design. Feelings included anxiety about needing to produce faster, lack of confidence in shifting from expert to novice, and shock about how different design is from social sector approaches:

> There were expectations that weren't clear about how designers worked. In design, sometimes you talk for a week . . . I didn't understand this at first. I wish I had gotten feedback on my anxiety to produce… you needed a lot of handholding. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> You need to somehow foster your Fellows' talents and help bring them into new environments because it's disorienting accompanied by a loss of confidence from the shift from expert to novice. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> It was a real struggle . . . The first couple of months were very hard and frustrating. I had rough moments of slowly doing very different projects. I was trying to learn how to apply these methodologies in development and international health, and I remember learning about the design approach being shocked about how different it was. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

One Fellow suggested that the Fellowship program should be presented as an opportunity to learn HCD, where there are not necessarily expectations to bring prior skill or expertise into the program:

> Some [Fellows] felt pressure to bring in their past knowledge, skills, and question the IDEO[.org] Fellowship program. I think it would really help if the expectations were set up in the following way instead: "We hired you because you're awesome, even if you're out of your comfort zone . . . it's totally normal . . . We didn't hire you for your skill. We hired you for who you are and what you can be. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

Based on the information from these interviews, IDEO.org integrated additional educational opportunities into the Fellowship program:

> We have done a weeklong orientation where we bring in people from IDEO. We spend a lot of time with the Fellows to onboard them to the projects that we've done in the past: what's worked, what hasn't worked. We did the empathy-building day of being homeless in San Francisco. Then a lot of team-building exercises and reflection days throughout the year. I think that has been pretty effective. Then the bonding and learning that happens in the field is pretty paramount. — IDEO.org Staff (S16)

IDEO.org also developed a mentorship program, and IDEO.org's Creative Director and Executive Director became more involved in projects (IDEO.org Staff, S16).

Fellows also noted the need for support in transitioning out of Fellowship into new career paths:

> [IDEO.org could have a more] thoughtful way of transitioning Fellows out of the Fellowship. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> If you want to change the sector they [the Fellows] came from and where they go next, you're not going back into the point you came from. No one would have the same professional network that you had before. It's like you need to start a new one. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> I'm actually in an awkward position. I want to be in a space in the interaction between design thinking and development. I have a good sense of the kind of work I want to be involved in, but am trepidatious to be the one to have to advocate for it. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> I felt like I was working crazy hours in my last project and then trying to figure out my future in the last three months. If there's a professional coach who could help you understand your Fellowship as a springboard, it would be really useful. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> [The Fellowship] has to really make sense with your career and where you are and what you want to get out of it. It's hard for potential Fellows to understand the day to day, and what the Fellowship can offer you later. If profiles of former alumni's trajectory was shared on IDEO.org's website on a "Where are they now?" page, that would help with expectations and provide a strong cache connected with our names. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

IDEO.org has hired a few former Fellows as full-time employees and contractors on projects. From each of the 2011, 2012, and 2013 Fellowship cohorts, Fellows have continued with IDEO.org as permanent Project Leads or Design Leads. This has helped IDEO.org with organizational learning and continuity in addition to providing Fellows with more job experience in HCD for Social Impact. IDEO.org also maintains an email list to send former Fellows employment or contracting opportunities.

Moreover, being part of the IDEO and IDEO.org Network has been incredibly valuable for some former Fellows:

> It was great to be with the Fellows. I got a lot of great friendships out of there, both amongst the Fellows and the permanent staff. That was super cool to be able to take that away. That has continued to pay dividends both personally and professionally. It's a really cool network to be a part of. I value the [IDEO].org network the most but there's also this larger IDEO network, which there was an opportunity to plug into so I have friends out of the IDEO world. I'm still on a variety of different mailing lists connected to that network, which has been cool for different opportunities. Being a part of that network is pretty huge. — Former IDEO.org Global Fellow (S17)

> It was an incredible learning experience. Everyone was so incredibly talented and passionate about having meaningful impact in the world. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> I got exposure to a new set of people and possibilities and it opened a whole new world for me. Now I've found a whole group of people who are inclusive. The shared values of HCD outcomes are at least where we begin. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

4.2.2 Shift in Selection Criteria from Broad Experience to Deep Expertise

From 2011 to 2015, IDEO.org recruited a total of twenty-eight Fellows in four Fellowship cohorts. Each cohort included two to three IDEO designers and four to five social sector leaders. For example, in 2011, each of the three IDEO designers led a team of two to three other Fellows working on six-week to twelve-week design projects. Fellows were assigned to teams based on the expertise required to produce the best deliverable for each project. IDEO.org's website states "We employ top-notch designers, an elite class of businesspeople, and development experts,

making IDEO.org a flexible and creative organization uniquely situated to tackle poverty through design" (IDEO.org, 2014a). The terms "top-notch," "elite," and "experts" connote a high caliber of expertise. The one-year timeframe of the Fellowship and the prestigious connection with IDEO were competitive advantages that enabled IDEO.org to recruit social sector leaders:

> The Fellowship has prestige so it was able to get really high capacity, super-talented people to come for a year. I think the fact that coming for these discrete periods of time, you're able to pull people in a way a normal design firm wouldn't be able to do because they're looking at hiring people regularly. — Former IDEO.org Fellow (S17)

As the Fellowship program evolved, IDEO.org shifted its selection criteria for Fellows. Initially, IDEO.org was seeking Fellows with both design and social sector experience. They eventually shifted towards selecting for deep expertise in either design or the social sector:

> The first year, […] we wanted to find designers who also had social sector experience, this hybrid for the most part. I think that was a really tall order, and hard. I mean it's a very narrow set of individuals that you're looking for. I think we've found that we either needed all-star designers or people who brought deep social sector expertise, but trying to find somebody who is in the middle of those isn't necessarily going to be a rock star in any one of those areas. So either you go for people who have a very strong deep background of working in the field and understand the sector, or you find people who are amazing designers, but are interested, curious, and excited to learn about the social sector. I think that's where we found we had more success, when we didn't try to muddy the waters of trying to find this hybrid person. — IDEO.org Staff (S16)

IDEO.org also began to recruit more business designers as they realized the importance of business design for all of their projects:

> We've also found that business design has been increasingly more important for the work that we're doing. While we only had maybe one business designer in the first class, we now have two or three [business designers] in one of our Fellowship classes. I think that's been really effective because we always want to have somebody who has business design chops on one of our project teams. — IDEO.org Staff (S16)

Selecting design team personnel with relevant expertise enables IDEO.org to increase the likelihood of achieving their ultimate goal of producing measurable social impact through design.

4.2.3 Teaching the HCD Mindset Rather than the Craft of Design

IDEO.org staff acknowledged that there were perhaps mismanaged expectations. IDEO.org's Fellowship program was not intended to teach the tools of design (e.g., visualization, prototyping, or technical analytical skills), but rather the HCD mindset:

> We say we teach design [with the IDEO.org Fellowship], but I don't think that's what we do. I think we teach [a] creative, open-minded approach to problem solving. Teaching design means learning a craft that then you can use to problem-solve. That's one first mismanaged expectation. People think, "Oh, work with IDEO[.org], learn to be a designer." Sure you'll learn to think about things in a different way, more open-mindedly, more creatively, more empathically, but ultimately, it's hard because you'll be missing out on the tools to express the design. Maybe I exaggerate a little bit, but even if you don't know how to design in the traditional sense, like draw and build and envision, but you can strategize and build programs, that's still valuable so maybe it's more about the mindset that we're teaching. — Former IDEO.org Project Lead (S21)

IDEO.org's Creative Director affirmed that the importance of teaching the HCD mindset for spreading design in the social sector:

> One of our [IDEO.org] Fellows last year said, "I'm learning, but it's not what I thought I would," at a mid-point retreat that we had. And she said, "You know, I kind of came into this, and I thought I was going to learn about color, and how to make a product. And I haven't learned any of that. But what I've learned is how to be human-centered, and how to be open to many different ideas at once, and how to take risks, and be comfortable with things evolving and changing."
>
> To me, this really represented the best kind of learning. And I think it's also the path that we're all on as we bring design to these new places that need it so intensely. And it's, you know, it's the beginning of a journey. And we're all kind of figuring things out as we go. And some of those things are not what we thought they would be, but they're really critically important. — Patrice Martin, IDEO.org's Creative Director (Martin, 2012)

When Fellows elaborated upon what they learned through the Fellowship program, several of their examples related more to the HCD mindset than the craft of design:

> I now realize how many stakeholders there are in any given problem. With increasingly complex problems, there are more stakeholders involved because there are overlapping systems. The non-profit social sector comes with big teams, so trying to design the process of collaboration is fascinating to me and it's increasingly important to design the process. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> It's designed to have strong interpersonal relationships during hard projects. I'm constantly trying to get back to the IDEO.org way of working with relationships. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> We were pursuing a lot of different skills – product package, HCD, storytelling and lots of things that I'm still using in my work today. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> I learned the broader language of design. Currently, my projects are pure strategy and, with my design products, I'd been able to be in touch with a deeper empathy process. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> The Fellowship really helped me navigate some interpersonal things that I didn't have the chance to work on before because I'd been working alone. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> The skills that we learned as part of doing these projects and the experience of the projects have colored the way in which I designed. It deepened certain skills I had already from working in the social impact space, but I think there's something with the interview process and the synthesis and insights and prototyping that has folded more into my work as a result of doing the Fellowship. — Former IDEO.org Global Fellow (S17)

In addition to learning the HCD mindset, Fellows also learned the importance of client or partnership management and designing communications:

> I really learned the art of designing conversations. You can design interactions with clients the way we design other things. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> It would be beneficial to learn client management, storytelling, graphic design, putting together a compelling slide deck, concept, and deliverable that make it more likely for our clients to implement our suggestions. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> I've learned that the way that you can present info in a clean crisp manner makes a huge difference. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> From a systems perspective, my experience in IDEO.org gave me a lens to describe social sector design in a concrete way that's been easier to sell to clients and package the stuff that comes out of projects. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

> HCD provides structure to qualitative things. It gave me a language that helps me communicate this with people to the business world. I'm sold. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

4.2.4 Engaging Partners in HCD to Create a Movement of Design

The obvious value propositions for IDEO.org's partners are the innovative products, services, or programs that aim to improve the quality of life of end users. These are the intended outputs of the design projects. Over time, IDEO.org realized that an additional benefit of engaging partners in HCD was transforming how these organizations think and operate:

> It was exciting for us to see design as this way to start to take small risks, and try things out. I was in a meeting last week where one of our clients was explaining to someone on her team that this didn't necessarily mean it was the end solution. What it was, was a learning process to find out what might work, and to evolve into new things that they could do. And to me, this was sort of like the most exciting moment. Like, we're succeeding when we can get organizations to act differently and own this process. — Patrice Martin, IDEO.org's Creative Director (Martin, 2012)

> We partnered with an impact advisory firm last Fall [2014] called Global Impact Advisors. […] The advisory group did in-depth interviews with a series of our partners and a series of our board members slash thought partners (the people who advise us and have been close advisors/advocates of ours in different ways, in different fields). And one theme that came out of all those interviews, according to the Global Impact Advisors, was: One of the top things that people mentioned that in addition to the concept we delivered, the big take away for them was human-centered design as a methodology, and introducing them to a new way of thinking about their own problems, both within the organization and externally as they were working with communities and other partners. — IDEO.org Staff (S18)

> I'm proud of seeing how much we actually influenced our clients in their social enterprise and the ripple effect. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

One example of how IDEO.org has influenced partner organizations is how Marie Stopes International has implemented IDEO.org's concept of Diva Centers (a reproductive healthcare clinic for youth) and is continuing to modify it using the HCD process (S18):

> The big example, for me […], is how MSI (Marie Stopes International) as an organization has absorbed and taken forward human-centered design in its own way. […] We were partnered with them through the Hewlett Foundation two years ago in Zambia, and that partnership was a year long. […] Our main concept for them [MSI] was the Diva Center, and the Diva Center is not only a health clinic; it's a series of designs that all come together to create this experience for young women seeking sexual and reproductive healthcare. Because MSI came to us and said, "Well, we're not accessing youth. They're not coming in to be tested for STIs or HIV. They're not coming in for contraceptives, and they're ending up pregnant. How can we solve for this?"
>
> And the short story is, through that collaboration (which was one of, if not our deepest collaboration in terms of duration at IDEO.org), the Diva Centers have been running successfully. They're getting great numbers in terms of young people 15 to 19 [years old], who are actually going by the clinic. So they're seeing that our design is working and then they're now taking it forward through launching potentially three to four Diva clinics this year, in Lusaka as well as on their own, with our support.

> So that's been really nice to see, showing proof of our value and having it be validated by the quantitative impact side and the qualitative side. You go to the clinic and there are young people there and they're having fun. Some of them are painting their nails, some of them are reading, and some of them are getting services, but it's not something MSI had seen before. Then having them take forward our concept, our joint concept on their own, with our light support, and being able to start thinking about slight modifications that need to be made (I think instead of launching more of them) has been pretty great. And I think shows that point that came out of the advisory committee findings, that the methodology itself is a deliverable, similar to the concept we're delivering. It's just not something that's necessarily scoped in the beginning; it's something that comes with doing this work together. — IDEO.org Staff (S18)

IDEO.org has also helped organizational leaders better understand their employees and volunteers, and create a more inclusive culture:

> We did this work with Peer Health Exchange, reimagining or changing their volunteer experience. The work was great. I think they were satisfied with what we delivered. But what really changed them was the way that we engaged everyone at their organization. So not just the executive leadership team but the volunteers themselves and people who were managing the volunteers, really all the way from the bottom to the top. What we've heard is that they have restructured the way that they hold meetings and people feel it's a much more inclusive environment to be a part of and that's incredible change. That came through the way that we facilitated the workshops, the way that we engaged people, and the way that we told the stories of the volunteers that made it so that they were able to have empathy for their volunteers. They didn't feel this distance from [their volunteers], and they felt like they were real people. It's funny how sometimes that's our role, is to bring organizations together, but often that's the case. — IDEO.org Staff (S16)

Catalyzing these types of transformations requires an early introduction to HCD and consistent training throughout the partnership. IDEO.org actively tries to teach partner organizations the mindset and methods of HCD, starting before projects begin and continuing throughout the project (S18):

> Most [IDEO.org] Project Leads start a collaboration with partners with human-centered design workshops, and with sharing a little bit about the [HCD] Toolkit to [help partners] feel comfortable. I think that that leads to these partners then coming back to us and saying, "One of the more valuable results of our relationship was being exposed to human-centered design," or "we're excited to take this forward ourselves." But also, I think it's necessary to get people to feel comfortable with going through the process at all.
>
> Going through the methodology in a day, or a day-and-a-half workshop, or even if that's not possible, spending a few hours going through step-by-step what research looks like, why it's valuable, what prototyping looks like, why that's valuable, gets them a lot more comfortable with our work, especially because we move so fast. We move really, really fast. And a lot of partners move a bit slower because they're implementers: they're doing the work, they're collecting the data, they're managing it, and so on and so forth.
>
> So absolutely, it's the design team all bringing that thinking, that methodology from when the project starts. And [IDEO.org's partnership team is] doing that well before they start. So by the time they even get to kick-off day with the team, they know and believe that human-centered design can help them and are willing to dedicate team members to throw a project together, and have looked for funding for our work together. They're definitely into it, and then we bring them in to just a deeper level when the projects kick off. — IDEO.org Staff (S18)

Introducing partners to the HCD process is incredibly important to help them understand the process IDEO.org is using, and also to gain their trust (S18):

> [HCD] is kind of new, too. I mean maybe not here [in the San Francisco Bay Area], in the communities in which we live in, but we're consistently reminded from partners in other parts of the country that… They're like, "Yeah, everybody knows about design thinking where you're from, but you really need to

> explain it to me; you need to walk me through it." And it's especially the case for partners who have a more technical or more academic background, in which they have ton of methodologies and they're told already that that's just not right. They haven't yet worked on design projects, and its super, super, super important in both getting them up to speed but also gaining their trust as well. — IDEO.org Staff (S18)

IDEO.org design teams engage clients throughout the design process in a variety of ways. For the Clean Cookstove project with the Global Alliance for Clean Cookstoves, the design team shared "Postcards from the Field" to tell compelling stories about users, prototyping, and insights (see Figure 4.2). For a financial literacy project in Chicago, a representative from the client organization joined the IDEO.org design team in conducting field research and prototyping (Shoop, 2013). For another project on financial inclusion in Ghana, a team of representatives from the client organization was given daily design challenges to engage them in user research (Won, 2013). IDEO.org design teams are also staying connected with client representatives and end users through mobile phone applications:

> There's an amazing team right now working with Techbridge, which is an app for a school program for girls to engage them in STEM [Science, Technology, Engineering, and Math]. They are on an app called Kick that all of the students are using. I've never heard of it, but apparently it's very popular among teenage girls. So they're actually in constant communication with their partners. I just overheard them in the kitchen talking about how… they're like, "Oh my god! Look what they're doing right now with the girls!" I think that level of engagement and that personal connection is incredibly valuable. — IDEO.org Staff (S16)

Moreover, clients or partners are increasingly accompanying the design team in fieldwork:

> We're finding that [partners are coming along for fieldwork] more and more, which is great. They don't only observe what it means to do an interview; they're doing the interviews themselves. […] Not in every situation, but certainly there are definitely examples of that happening. — IDEO.org Staff (S16)

According to a former IDEO.org Project Lead, teaching people to embrace ambiguity is one of the hardest aspects of taking clients to the field:

> The hardest thing is there is a lot of ingrained behavior in people that for the first time practice design thinking or try to be designers like IDEO, that automatically are inherently against successfully practicing: so judging, jumping to conclusions, feeling anxious around ambiguity and not really knowing where you're going or where you're coming from or what the solution space is. A lot of people are taught, or not taught, but have these as attributes in the way they operate and those are really big barriers to being a successful designer.
> A big part with taking clients to the field, a big part of teaching design is getting people to suspend their beliefs, to be tranquil in a really abstract and uncertain situation, just trust the process and trust their intuition. A lot of these things are not natural to a lot of people. […] When not everyone on the team is on board with these principles, it adds a lot of friction to the process because there's a lot of questioning, there's a lot of back and forth, there's a lot of judging and that slows down everything. So I'd say the most important thing is getting people to let go of these things and come along for the ride.
> In a way, that's why [the SmartLife clients] were so good. They were bought in; they were excited about working with us. [One of the clients] was very experienced, but they were also like, "You guys are the experts; take us along for the journey." They let go of a lot of the way that they operate normally. I think people find that very liberating, that's why they seek out IDEO.org. — Former IDEO.org Project Lead (S21)

Weekly Postcard 2/16/2012

The IDEO.org team is in Mwanza, Tanzania! We first met the GVEP team, who provided insights about their program strategy and introductions to entrepreneurs. Through those entreprenuers and other acquaintances, we are connecting with current and potential end users.

Mama Fausta (aka Mama Jiko Bora), Entrprenuer
An ambitious business-woman, Mama Fausta runs Jiko Bora, a clean cookstove company. She makes various products from small household and double burner stoves to bread ovens. Though moderately successful, her business and products lack a level of sophistication required for real growth. Design improvements could reduce manufacturing costs and marketing and branding could differentiate her product. Longer-term capital would enable her to invest in equipment and produce in advance, avoiding the current delays of her made to order system.
How might we provide a set of tools to help entrepreneurs create more sophisticated and efficient businesses?

Inema, End User
Nienteen year-old Inema and her family are Mama Jiko Bora's neighbors and customer. The family originally owned an unlined cookstove. Living next to Mama Jiko Bora's workshop they decided that it was time for an upgrade. The family gave Mama Jiko Bora their unlined stove to modify with the ceramic liner.
How might we introduce the concept incremental upgrades to cookstove adoption?

Leah, End User
We met Leah in Magu, where she lives in a compound near the town center with her grandmother and five others. Her family has both a three stone fire and a cookstove. The cookstove was purchase two years ago by her uncle who thought it could make cooking easier. Yet, despite owning a cookstove, Leah continues to use the three stone fire, particularly when there is no money to buy charcoal.
How might we market clean cookstoves as an supplement rather than replacement to encourage adoption?

— Your IDEO.org Team

Figure 4.2. IDEO.org's Postcard from the Field for the Clean Cookstoves Project (IDEO.org, 2012d, p.21)

With more client training and engagement in the HCD process, clients are able to synthesize insights, prototype, and iterate after the consulting project is completed:

> We know that we're on the line for holding workshops and doing different check-ins along the way. Ultimately that's better for us because it ensures that our partners feel empowered to carry on the work. They don't feel like we're just leaving them with something and they don't really know how to iterate on it. So if we can teach them how to prototype and how to refine and how to synthesize, then should anything go wrong or they need to change something, or they want to build on it, then they're empowered to do so. And hopefully we're always there to support that, but that furthers and betters our work, so it's in everyone's interest I think to do so. Then, we also are then ensuring that they're really engaged and understand how we got to this idea, and then where we're going with it. I think there's something to be said for the big unveil at the end of a project, but sometimes that can go horribly awry, so I think this is a much better approach. — IDEO.org Staff (S16)

IDEO.org intentionally involves clients especially when the client will have to continue iterating and evolving the solution during implementation:

> When we know that a project is going to have to evolve when it's in the hands of a partner is when it's really important to bring them into the fold. I think it's always important to bring them into the fold. With MSI [Marie Stopes International], we brought one of [the client representatives] here [to IDEO.org] so that she could experience what synthesis was so that she could make sure the voice of the nurses who work at

> MSI and the leadership and the girls that they serve was involved in developing the story. So I think there are times when it's highly valuable for us to make sure they understand our process. — IDEO.org Staff (S16)

A former IDEO.org Fellow also emphasized the importance of getting clients or partners involved in the design process to enhance buy-in and also to train them to be human-centered designers:

> A really important thing that I've definitely sought to incorporate in all of my projects moving forward, is getting the client engaged not just as a person who is reviewing information as you're developing it but actually participating and [doing] on the ground work in the development of the project, whether it's sitting in on the interviews or participating in prototype sessions or coming as part of the synthesis. Getting them into the weeds, if you will, of the design process is actually super important because if it's something that they're handed over at the end, they don't have skin in the game. They're not vested in it in the same way. If they're part of the act of creation, I find that they really take it to heart if they're part of the whole thing.
>
> In any project, you're also training the client to a certain degree. You're training them to also be human-centered designers because no project (I don't care if it's done in the consultancy model or in a traditional non-profit model) is never, ever done when you're handing it over to the client. It's always going to have a life of its own. If there's not some transference of skills to the client to be able to understand how to intuit certain things and be able to do that evolution, then the project fails somewhat. — Former IDEO.org Fellow (S17)

Going beyond transforming partner organizations, IDEO.org is trying to create a movement of design in the social sector. By designing for networks rather than an individual client and designing compelling ways to share their work, IDEO.org is extending its impact to organizations beyond those they engage with directly:

> For me, it's been different in how we have to think of ourselves as designing for networks. There's no one client. There are many organizations that are acting together to try and create change. Last year, we had the opportunity to work with the Global Alliance for Clean Cookstoves, and they asked us to look at cookstove adoption, and to essentially come up with a report of insights and opportunities, which we felt was all fine. But really, when we think about what design can bring to this, we need to push it. We need to push it farther. And we need to show ourselves as storytellers, and the way in which experience and viscerally getting something can bring real power, and bring real influence. So what we then did was say, "Okay. We'll do a report. But we'll also make a video that we believe will get at much more of communicating the essence of this problem." […]
>
> That [video] was something we were able to share quite openly with the network. And the Global Alliance has a really great connection to many different organizations. And what was powerful for us is that this work then got distributed to organizations that we actually had no contact with during the actual phase of the project. And they have then communicated with us that they were changing the way in which they were designing cookstoves based on the learnings that they had from this work. So it's been exciting to say that a project is not a starting point. It's not an ending point. It's a piece of all the work that we're doing together. And to think of a way in which we're using design as influence as much as the artifact or the offer that we create. — Patrice Martin, IDEO.org's Creative Director (Martin, 2012)

> We really cultivate deep relationships with other nonprofits and other design firms that are all working together in the social sector in different capacities and across different sectors. — IDEO.org Staff (S18)

To maximize impact beyond the project client, IDEO.org has been sharing excerpts or entire project reports that other organizations may learn from or implement:

> We posted all of the [Cookstove Project] documents online and we were getting emails from folks being like, "Oh that's super interesting. Can we have a call with you? Because we'd like to figure out how to implement some of this stuff on the ground." Or with Unilever, [a client] was like, "Oh, I'm going to send

this to our team in East Africa who is working on cookstoves because this is super helpful for them." There were other ways that we were able to disseminate beyond the client, which I think is something that is interesting to think about in these kinds of projects. What are the other avenues of getting information out there so no matter where the client is, it means things move forward. Other people can benefit from this work being done. — Former IDEO.org Fellow (S17)

Furthermore, prior IDEO.org clients, partners, or funders are hiring in-house designers or developing design programs and initiatives:

What's been even more rewarding [than partnering with organizations to design social enterprises] is that WSUP [the nonprofit Water and Sanitation for the Urban Poor] has hired human-centered designers. They've developed a whole program called WSUP Enterprises, which is about designing social enterprises in line with needs of communities. They've really embraced and adopted human-centered design as part of their organization. — Jocelyn Wyatt, Executive Director of IDEO.org (as quoted in Skillbridge, 2015)

I'm also seeing situations where people are bringing in-house designers. They're reaching a point, like WSUP [Water and Sanitation for the Urban Poor] Enterprises is going to hit that point. They've done it in a way already with an in-house designer to spearhead things, either driving it themselves or being the chief liaison with the contracted design team. Or you'll have things like [the Bill and Melinda] Gates [Foundation], which is now having their HCD position. The expectation of that position is not only helping them think about funding HCD projects but also offering technical support for clients who are thinking about HCD practices in their scope. — Former IDEO.org Fellow (S17)

We're seeing things change. A couple of weeks ago, the Clinton Global Initiative — their theme was actually designing for impact. And President Clinton is on the stage, and using design as if he's been a designer his entire life. And I think that really speaks to what we're all building. — Patrice Martin, IDEO.org's Creative Director (Martin, 2012)

4.2.5 Lessons Learned from IDEO.org's Fellowship Program

The evolution of IDEO.org's Fellowship program is indicative of lessons learned in trying to address the dual goals of design practice and design education. Over time, it became clear that IDEO.org's core competencies and priorities centered around the goal of design practice. These lessons learned set the foundation for understanding IDEO.org's discontinuation of the Fellowship program and the shift from the Project-Based Consulting Model to the Programmatic Model, which will be discussed in Section 4.3.

To support IDEO.org's prioritization of design practice, learning-by-doing was the most efficient educational model for IDEO.org's Fellowship program since it was entirely practice-based. Some Fellows expressed a desire for more autonomy and the opportunity to direct their learning to build skills in particular areas. However, in order to achieve the best project outcomes, design teams were formed based on the skillsets needed for the project, rather than individual preferences. There was also a trend towards recruiting personnel with more specialization and deep expertise. Initially, IDEO.org sought Fellows with hybrid experiences in both design and the social sector. As HCD for Social Impact is a nascent field, few Fellowship applicants fit these criteria. IDEO.org realized that recruiting for either deep expertise in design or in the social sector was more effective than seeking Fellows with hybrid experiences.

Several of the changes associated with the Programmatic Model were in service of the goal of design practice. In Section 4.3.1, we see a continuation of the trend towards specialization in the Programmatic Model's focus on teen reproductive health and financial inclusion, rather than working across many project sectors. Section 0 illustrates how shifting from 12-week design projects to yearlong or multi-year partnerships has enabled IDEO.org to further disseminate

design solutions. In order to provide in-depth expertise in the focus areas and long-term support, IDEO.org discontinued the Fellowship program, and instead hired permanent design staff and development experts (see Section 0). Section 0 describes how IDEO.org is providing design support for partners throughout implementation to increase the likelihood of achieving social impact.

It is also interesting to note the changing trajectory of IDEO.org's design education efforts. Initially, the Fellowship program aimed to train Fellows in HCD so that they could disseminate HCD throughout the social sector at the completion of their one-year of training. Although some Fellows hoped to learn the craft and tools of designers, it became clear that the Fellowship program was more effective in teaching the HCD mindset. IDEO.org also realized that engaging clients in the HCD process increased buy-in and yielded better results during implementation. Moreover, as IDEO.org invested more efforts in training clients in HCD, clients could continue to practice HCD in other areas of work. Section 0 describes how IDEO.org is expanding beyond supporting client organizations to build HCD capacity in social sector fields. Section 4.4.1 describes IDEO.org's new educational resources and programs for teaching HCD to tens of thousands of people worldwide.

4.3 Shift from the Project-Based Consulting Model to the Programmatic Model

IDEO.org's Project-Based Consulting Model was a distinguishing feature in the non-profit sector. The "quick time cycles" and more defined scope of projects means that there are deadlines or milestones that lead to concrete changes happening faster than in typical non-profit work (S17):

> IDEO.org is a non-profit consultant, but I think it's the consultant model is the thing that differentiates it. A lot of the organizations that were existing in the social impact space prior to IDEO.org were generally more like traditional non-profit design centers or they might be non-profits doing stuff, like they're developing products or buildings or programs as they get funding to be able to do that from foundations, grant support, etc. and it's this longer term process that doesn't have a finite cycle. […] The consultancy model is much more based on very quick time cycles and a pretty set scope of stuff that you are working on and you may still be working towards a longer [term], larger goal but you're doing it with a much more finite constraint. It's scoped a little bit closer to what you would think of when you're operating in the for-profit business world where you've got this project, you've got to hit these deadlines, etc. And that's not how a lot of the non-profits tend to operate. Their goals tend to be much longer [term]. — Former IDEO.org Fellow (S17)

> It's helpful to have a deadline. A lot of times a lot of projects just keep going and going and going. It means that you can spend years on something whereas by having a deadline where you're trying to hit a certain target, that actually localizes the work in a really interesting way. It doesn't always work, but I think it's an interesting dimension to add into any project. I think ultimately doing change is going to rely on being not just solely in the non-profit [sphere]. It's a broken model if you're just focusing exclusively on the non-profit sphere of doing things. For me, we're finding these intersections of stuff from the business world that can be brought in and actually make a lot of sense. — Former IDEO.org Fellow (S17)

However, the fast-paced nature of Project-Based Consulting Model might also be incongruous with the long timelines that are typical in social sector work (S21):

> I think [IDEO].org is changing this, but the very IDEO-esque consulting model doesn't work in the social sector. Designers are impatient people and social sector work has long timelines. Monitoring and evaluation is really important, and designers don't have patience for it. There's a bunch of things that inherently make [IDEO].org challenged in doing this work. It's hard. Because they have designers, a lot of these things are true. And I really do think that designers are like little kids. They get impatient. They get bored. They want to move on to the next thing. There's a big piece of social sector work which is much more thoughtful and long-lived and in-depth. It's about reading and digging into secondary research and all those things I don't think (historically at least) IDEO and [IDEO].org have been good at. — Former IDEO.org Project Lead (S21)

On the other hand, designers can produce beautiful, inspiring concepts that can capture the imagination and offer a lot of value to the social sector (S21):

> On the flip side, [IDEO].org has talented designers, and talented designers are able to make things tangible really quickly. We have no patience, but we are able to translate things into concrete solutions that we can try out. We can interpret the large amounts of data in an intuitive way and spew out solutions that feel great sometimes. That's what makes [IDEO].org special. Plus because they have really good designers, they have the ability… Great design is emotional. Great design touches the heart and makes people think about the future and broadens their mind. When they get to design things, then they get to output things that are, even in a very simple way, exciting and beautiful to look at in a sector where usually things are bleak and boring. That's their competitive advantage. — Former IDEO.org Project Lead (S21)

In 2015, IDEO.org began to transition from a Project-Based Consulting Model to a Programmatic Model. A former IDEO.org Fellow comments on how the new Programmatic Model allows IDEO.org to maintain the beneficial aspects of having rapid project-based design cycles, while engaging in long-term partnerships that increase the likelihood of achieving impact:

> The time cycles are both the asset and an Achilles heel depending on what you call the goal for the project, which I think is why IDEO.org has switched to a model where […] they have thematic areas that they're working towards and you're already scoping with the client that you might be doing multiple engagements. It's still based on this idea of having a short time cycle to do great bursts, but because you have four engagements with the client you can actually get that longer impact cycle because it's actually impossible to reach impact in eight to 12 weeks. You can kick-start a lot but it's by having a couple of engagements that get even deeper into the impact. — Former IDEO.org Fellow (S17)

With the programmatic model, IDEO.org emphasizes that they are not consultants delivering work to clients; instead, they are developing long-term partnerships with organizations to achieve shared objectives and outcomes:

> We don't like to think of ourselves as consultants. At IDEO.org we talk about having partners rather than clients. We're really looking to develop strong partnerships where we're working really closely with organizations for longer periods of time, with a set of shared objectives and outcomes that we're trying to reach at the end of that. — Jocelyn Wyatt, Executive Director of IDEO.org (as quoted in Skillbridge, 2015)

IDEO.org's Executive Director further elaborates upon the other qualities of an ideal design engagement, and the mindset that informed the development of the programmatic model:

> In terms of an ideal project, we're more agnostic in terms of what the specific poverty-related challenge is. But we're looking for people that come to us with great questions. We are certainly looking to work with partners who have great implementation capabilities and are open to innovation and human-centered design. We're looking to engage with them for long periods of time. We want projects that are a year or longer that really allow us to go deep with partners. We like challenges where we're learning but we're also bringing

our expertise. This includes global challenges like reproductive health, where we're able to continue to build on what we learn and where we have designers who are becoming experts in that field. That's really rewarding for us because then we feel like we're able to contribute even more rather than starting fresh each time we engage in a new project. — Jocelyn Wyatt, Executive Director of IDEO.org (as quoted in Skillbridge, 2015)

4.3.1 The Advantages of Focus Areas

With the Project-Based Consulting Model, IDEO.org worked in a diversity of project sectors: water and sanitation, agriculture, health, financial services, gender equity, and community building (IDEO.org, 2015g). With the Programmatic Model, IDEO.org is focusing on teen reproductive health and financial inclusion:

> One of the big ones that we're working on right now is access to reproductive health services for adolescent girls in sub-Saharan Africa. Traditionally, reproductive health programs have focused on creating cost-effective solutions for mothers in terms of birth spacing, or when they're done having children. But very few have focused on targeting adolescent girls. Reducing unplanned pregnancies amongst unmarried adolescent girls is certainly one issue that we, at IDEO.org, will work to tackle in the next ten years. […]
> Another issue we can tackle is mobile money. We've done a lot of work on financial opportunity and access to mobile money products and really making mobile money products more desirable and easier to use for people. We've done work on mobile micro-health insurance. On savings products, on loan products, on transfers; that whole package on what the mobile phone can deliver in terms of financial opportunity is really significant. — Jocelyn Wyatt, Executive Director of IDEO.org (as quoted in Skillbridge, 2015)

These program focus areas were selected based on the potential for design to have an impact, the passion and skill set of IDEO.org's design teams, and the interest of partners and funders (Wyatt, 2014):

> Our role, our organization, and our structure is in the process of changing very dramatically from a project model, where […] it's a mixed bag of different projects to what we're calling the programmatic model, where we're focused on youth reproductive health and financial opportunity. […] And then, we have Launch Pad, which is a bit more similar to the project model, where we're investigating what projects could turn into programs in the future, and we're being a little more experimental. — IDEO.org Staff (S16)

> [The selection of program focus areas] probably ties a lot more to where we saw appetite from our partners and funders. […] It was through our work with Marie Stopes International, which is the project we've been working on for about a year and a half, that's funded by the Hewlett Foundation. They were extremely excited about how promising our work was and wanted to continue it and make sure that it was implemented well and had a lot of consistency and rigor behind it, and that's what led to that foundation wanting to engage us in a year's worth of work. […] We've gotten a lot of traction from a few different partners, like CGAP [Consultative Group to Assist the Poor]; we've worked with CFSI [Center for Financial Services Innovation], J. P. Morgan Chase. There's just a lot of activity and demand for [financial inclusion]. — IDEO.org Staff (S16)

The shift from the Project-Based Consulting Model to the Programmatic Model has had several advantages. The focus areas enabled designers to develop expertise and intuition that informs other project work in similar fields, while providing enough flexibility to remain inspired:

> As a practitioner, for me, it's been different obviously, to come into this space [of the social sector]. And it can be overwhelming. And it can feel so foreign. And you can feel stripped of the tools that you usually use just on a daily basis. We [designers] all mix in inspiration and insight and intuition into how we

work. And when you're in a really different place, you can lean more heavily on insight, and not know what to do with intuition or inspiration. It doesn't feel as accessible as it is. And these things are still critically important to our roles as designers here. But they just have to get repositioned and we have to find our way back to them. One of the ways in which we're doing that is through building up focus areas and places where we're working in the same type of content.

> When we tell folks in the social sector that we focus on poverty, they're always like, "That's not a focus. Yeah, that's everything." And when we tell designers, we tell IDEO that we only work on poverty, they're like, "That is so limiting. How do you guys stay inspired?" And so we think there might actually be a sweet spot where we can start to learn and see patterns. But at the same time give us enough flex[ibility] to be inspired. — Patrice Martin, IDEO.org's Creative Director (Martin, 2012)

Having a permanent design team has also facilitated cross-pollination of ideas and insights across projects.

> We are able to take learnings that we're picking up abroad from doing work with selling micro-health insurance through mobile technology, [and ask], "What are the insights that we're learning there? Actually, how are they applied to our domestic portfolio?" It is shocking to me that that would be the case; that these very different contexts can actually inform each other. — IDEO.org Staff (S16)

> Because we have the same set of people working on those projects, they're able [cross-pollinate ideas and insights between projects], which wouldn't have been possible necessarily in the other project format, where we would mix up teams all the time. Because we have the same group of people more or less working on those projects, they're able to see and make these connections. — IDEO.org Staff (S16)

The specificity of the program focus areas has also attracted new funders and partners:

> When we were looking to just any project that came through our doors, it was almost harder to find partners that we wanted to work with, but once we decided and put a stake in the ground in a few different areas, the specificity of it actually enticed more partners. — IDEO.org Staff (S16)

4.3.2 Building HCD Capacity in Social Sector Fields

With the transition from the Project-Based Consulting Model to the Programmatic Model, there have been significant changes in how IDEO.org manages partnerships. For example, IDEO.org is positioning itself to support the reproductive health field as a whole, and planning longer-term and more broadly with partners about their shared vision for the reproductive health field (S18):

> [IDEO.org's Fellowship program] was a classic consultancy model to a certain extent, like a pipeline of projects of varying lengths, and start and stop dates, and also with a variety of different focuses. We were working across ag [agriculture] and health and education and sort of everything. […] The shift to programs, I think it […] will continue to require deep relationships with foundations and grant funders, because we're pulling in resources and cultivating relationships within a specific field rather than just merely based on a 10-week project. […] How do I know I'm cultivating the right partnership? How do I make sure that we're investing in the right relationship in a very early phase? We're now coming up with lists of people that we want to connect with in advance for the next few years because we want to really live in the space of reproductive health. We don't want to just be like a visitor to it; we want to be in the space with these people who are serving women and men all over the world and providing new services.
>
> It's less about like, "We have a great relationship. When can we do this work? Who will be on the team? When we'll start, when we'll stop? When is a good time for them? When is a good time for us?" All those questions are still asked and still very much on the table, and there's another layer of questions that come after it. "What is the big picture of this partnership, with [a foundation], for example? What do they ultimately hope to achieve in reproductive health? How can we help them achieve that in reproductive health? What is the ultimate mission of [a partner organization]? What is their growth strategy for our

> concept? How can we remain committed to them and committed to that through the structures that we're evolving here and having people dedicated to this work?" It's a really different mindset, from a partnership perspective. We are still a consultancy, obviously, but from being structured less like that and more programmatic; it's pretty different. — IDEO.org Staff (S18)

In addition to cultivating partnerships across its focus areas, and continuing to offer innovative solutions through HCD, IDEO.org has been increasingly doing capacity building for partners and proactively spreading information about the impact of HCD in its focus areas (S18):

> Also, there are a lot of different things that come with programs. Design is always our core offering, and that's always been the case. In addition to that now, we need to have some capacity building in the sectors that our programs are working in. How do we bring the reproductive health world into HCD and introduce that to them? How do we prepare other partners to receive our design support? And how do we build networks that are strong?
>
> Then the other is how do we tell the story of our work in this field? And is it impactful? How do we track all of that and make sure we're doing the right work? How are we pushing our craft? How are we actually pushing our designs in the field of reproductive health? So I think with program models, there are different layers on it that maybe there were less of in the more consultancy-based model. — IDEO.org Staff (S18)

One way that IDEO.org spreads information about HCD in the reproductive health field is by highlighting the impact achieved through its design projects and leveraging the insights gained to benefit other partners (S18):

> The Hewlett Foundation invested in us, as I said, heavily and has been for two years in the field of reproductive health. Because there are successes in working for them on this, and them being Hewlett and MSI [Marie Stopes International], and improving their reproductive health strategies and programming for reaching youth, the Packard Foundation came over and was like, "We want to be doing that too." And basically through the relationship with the Hewlett Foundation, we've cultivated this great relationship with the Packard Foundation that has resulted in us helping their youth-focused grantees, think about how they're approaching youth, and how they can better access youth, and what being youth-centered really means. That's another example of capacity building […] as much as how information is spread throughout a sector. — IDEO.org Staff (S18)

4.3.3 Flexible Long-term Funding

Unrestricted funding may be the future of innovation in the social sector. IDEO.org's Executive Director emphasizes the need for unrestricted funding or innovation funds that will enable nonprofit leaders to use their on-the-ground expertise to best serve their constituencies (Wyatt, 2015):

> In the past 20 years, foundations' approach to funding has shifted. They now strongly value private-sector perspectives, and many hire management consultants to lead their organizations. This cadre of foundation leaders believes that nonprofits can be far more efficient by decreasing overhead and delivering on programmatic objectives. But efficient can be the enemy of good. As nonprofits try to comply and cut back on discretionary spending, many foundations become frustrated that the models aren't delivering on promised outcomes. They turn to the experts within their own walls and write more prescriptive requests for proposals from nonprofits.
>
> The result is a bevy of missed opportunities. Many nonprofits are a lot less innovative, because program ideas are coming from the outside, not from those who know the field best. Nonprofits have to define their strategies by chasing the funding that foundations are putting up. At times, this means entering a new geography or even developing adjacent areas of focus because of funding opportunities. This situation forces the on-the-ground experts who are running nonprofits to wedge their work into someone

else's programmatic goals. But unlike foundation leadership, nonprofit leaders are uniquely positioned to understand the specific and evolving needs of their constituents and develop solutions to support them. […]

So the question remains: How might we leverage nonprofit expertise to more innovatively serve constituencies in need? First, we need to eliminate overhead caps and allow nonprofits to structure their budgets however they choose. Second, we need to provide more unrestricted funding to give nonprofits the flexibility to pursue exploratory efforts outside directly funded projects. And, finally, when unrestricted funding is not possible, foundations and philanthropists should either provide innovation-specific funding to encourage nonprofits to evolve and refine their models, or at the very least partner with nonprofits to develop new models together. — (Wyatt, 2015)

IDEO.org has set up an innovation fund which allows them to select and provide design services to partner organizations with the highest potential for innovation and impact:

One of the things that I'm excited about (speaking of designing new networks) is a funder of ours has given us or helped us set up something called an innovation fund. That allows us to choose organizations that we work with. And they apply. And how we've set this is up is to actually then say to organizations that we really respect, who have great networks of their own (like Skull, and Omidyar, and Draper Richards, and Acumen Fund), and ask them to nominate organizations who then apply. And we've been able to then select four organizations that we continue [to support] with design services. So then we're actually thinking about all of the organizations that apply, the places that we focus in, and the partners and the networks that surround them. — Patrice Martin, IDEO.org's Creative Director (Martin, 2012)

Longer timeframes and flexible funding enables IDEO.org to further disseminate design solutions or apply insights from design projects to other contexts:

We're able to secure yearlong funding, which gives us so much more flexibility. It allows us to be a lot more experimental. We're not on this crazy timeline of going from a 12-week project to a 14-week project. We actually have so much more room to play around and then actually see if [the Divine Diva's] model, which has been very effective in Lusaka [the capital city of Zambia], can be transferred to Kenya or Mali, or wherever else we think there's interest. — IDEO.org Staff (S16)

Our Moneythink veteran's project was an offshoot of our work that we did to engage Chicago youth in developing financial literacy. We took that platform [for youth] and thought about a totally different demographic of veterans, who are trying to re-enter [society] and are faced with a number of different financial difficulties, and [we looked at] how we can use the mobile technology and apply it to a different context or new group. […] What's exciting about that work [in mobile technology]… we just similarly saw that there are so many different opportunities. It's a really easy way for us to think about scale because they're all reliant on mobile technology for the most part. That's one way we can ensure that it's going to get into thousands of people's hands. — IDEO.org Staff (S16)

A great example [of designing for scale] is Moneythink. We developed this platform. Now let's figure out what other demographics could use it. So the veterans. We also did this project with formerly incarcerated individuals. While it wasn't the same platform, there was a lot of learning that we took from that. — IDEO.org Staff (S16)

It is unclear how the Programmatic Model will influence other aspects of IDEO.org's design process. With the Project-Based Consulting Model, there were small budgets and tight timelines that required design teams to be "scrappy" (S16). Being scrappy meant that sometimes the design team would only have one visit to the field and only a week or two to interact with end users, so the design team would sometimes ideate and prototype before leaving for the field, and conduct user research while gathering feedback on the prototypes (S16). Whereas this practice of prototyping before going to the field has enabled IDEO.org design teams to reach a

solution faster, it was a practice borne of necessity, and IDEO.org plans to experiment with whether or not to continue this practice given the longer timeframe afforded by their Programmatic Model (S16):

> With our change to programs, we'll have a bit more time. I think we [ideate and prototype before going to the field] because we have to. It's not always the most desirable or easy solution on our designers. So I imagine for some projects it will still happen. Like for Launch Pad, which is more similar to the way we operated before, [where] you only have 12-week projects, then you may be forced to do that a little bit more. But I think we always want to go get our ideas into the hands of people or the heads of people as fast as possible. So I think creating those timelines, whether or not they're real or not is a pretty healthy thing, and it keeps everyone on their toes. I think we've seen some remarkable things to come out of it. So whether we can manufacture those, it's to be seen. So we'll see if that's really effective. — IDEO.org Staff (S16)

4.3.4 Discontinuation of the Fellowship and Shift to Permanent Design Staff

IDEO.org initially planned to recruit a new cohort of Fellows each year rather than having a permanent design staff. The intention was to provide opportunities for IDEO Senior Designers and Project Leads to practice HCD in the social sector, while training social sector leaders in HCD so they could spread HCD throughout the social sector. The challenge with integrating a design practice component into any design education program is that the learners start off as novices, gain competency throughout the program, and finish the program at the peak of their performance. Starting each Fellowship year with a new class of Fellows, who may be new to HCD, resulted in a steep learning curve. When the Fellows were fully trained, they would leave IDEO.org and it was difficult to maintain institutional knowledge:

> When you're bringing people from the social sector who are familiar with working with other social enterprises or non-profits or foundations and don't have a necessarily design thinking mindset, it takes a while to onboard them to the process of what it means to employ human-centered design in these contexts. So I think there's a bumpy start to some degree. It also puts a lot of the burden of teaching new people this process on our designers, and there's a lot of weight on the very first project that we have to deliver really high quality work. — IDEO.org Staff (S16)

> Once the Fellows are fully trained and off and running and doing really well, we're then approaching the one-year mark. They then are leaving our organization and it's really hard to capture all of the learning and insights that they've gathered along their journey. So we're having to reinvent the wheel each time we embark on a project that we may have done in the past, but we didn't have that institutional knowledge in our organization. — IDEO.org Staff (S16)

> For me, the challenge of the Fellowship model was: once you train these people, you lose a lot of institutional knowledge when they go back out into the world. — Former IDEO.org Fellow (S17)

Moreover, with the shift from the Project-Based Consulting Model to the Programmatic Model, IDEO.org needed staff with deep expertise in teen reproductive health and financial inclusion. With the Fellowship program, applicants might not necessarily have the deep expertise needed for the program focus areas. IDEO.org decided to discontinue the Fellowship program until it could better understand the needs of the new Programmatic Model:

> Because of that change [from the Project-Based Consulting Model to the Programmatic Model], we've had to rethink the value of our Fellowship. This is the thing we identified about a year ago when we were thinking about how Fellows would fit into this new model where we actually want deep expertise in a different area. So right now, one of our Fellows is a pediatrician, and she's worked with youth with

HIV/AIDS in developing world contexts. And so she's staffed on the Reproductive Health Program, which is awesome, but we may not get that with the next group of Fellows. So we've decided to postpone the Fellowship at least for the near future until we better understand what our new model needs. — IDEO.org Staff (S16)

A former IDEO.org Fellow commented on IDEO.org's decision to discontinue the Fellowship Program:

[It was a] double-edge sword because IDEO.org wanted to spread human-centered design into the larger world and felt [the Fellowship Program] was a great model for doing that. If you look overall at the collective group of alumni, a lot of people went off to do things where they are bringing it to different quarters, like I teach human-centered design and I run workshops. I'm brought in to do trainings at companies, which I would not have been able to do had I not done the IDEO.org Fellowship. […] In the end, [IDEO.org] had to choose what was more important to them. Was it about spreading human-centered design into the world, or was it about developing a core practice with quality projects that continue to push the bar on what good design was in this space? Now that the Fellowship is closing, ultimately they chose the latter. — Former IDEO.org Fellow (S17)

With the Project-Based Consulting Model, it was difficult to coordinate schedules so that partners, designers, and funding would be available simultaneously:

What was also difficult about [the Project-Based Consulting] Model, is that we were so constrained by the timing. Would a partner be ready to work with us when the funding would be available? And our team was in between two different projects. It was impossible to coordinate it all. — IDEO.org staff (S16)

With the Programmatic Model, IDEO.org can plan for the long-term and has built up a permanent team of designers, who have multiple years of experience designing for the social sector and are always available:

The social sector has long lead times. I mean, it can take us anywhere from, like, six months to two years to get a project to actually start. […] It's pushed us to actually change our own model. Instead of just acting responsively to requests, to [instead] say, "Let's think about how we can plan out chunks of work." — Patrice Martin, IDEO.org's Creative Director (Martin, 2012)

If we're able to secure at least yearlong or multi-year long funding, it gives us so much more flexibility to bring in people from IDEO or contractors from outside when we need it, but we have this dedicated team that's more or less always available. — IDEO.org Staff (S16)

The fact that we've built our permanent team is probably the biggest change. So we have designers who are hopefully with us for multiple years, not just one year, as opposed to the first year. Everyone was only there for a year and there weren't any people who had a year of work under their belt. Everyone was fresh to this work or the context that we were working in. So now we have Project Leads who now each have two years of work at IDEO.org, and that's super important. So they know how to work with people who are completely new to design, they know how to onboard them, they know it's going to be difficult, and they have better consulting chops. […] Not everyone has worked with clients or partners and knows how to present in front of a big group. When you travel to a country with your partner in tow, that takes a lot of finessing sometimes. You should be on your game all the time. I think when people are a little bit more junior and don't have that experience, it's challenging. — IDEO.org Staff (S16)

When comparing the responsibilities of an IDEO.org Fellow in 2011 with those of a Senior Business Designer in 2015 (see Table 4.1), it appears as though job responsibilities have changed in correspondence with the changes from the Project-Based Consulting Model to the

Programmatic Model. For example, whereas Fellows worked on projects spanning "a range of social innovation work" (P. Martin, personal communication, June 2, 2011), the Senior Business Designer was assigned to be a "member of IDEO.org's Teen Reproductive Health program" focusing on "sexual reproductive health care for youth" (IDEO.org, 2015f, p. 1). The job description for the Senior Business Designer also suggests the importance of supporting partners in driving their own innovation, developing concrete plans for scale, and business design.

Table 4.1. Excerpts from the job descriptions for an IDEO.org Fellow in 2011 (P. Martin, personal communication, June 2, 2011, emphasis added) and a Senior Business Designer in 2015 (IDEO.org, 2015f, emphasis added)

IDEO.org Fellow (2011)	IDEO.org Senior Business Designer (2015)
As an IDEO.org Global Resident, you will have opportunities to work across an interesting, diverse, and difficult set of poverty-related challenges. Your responsibilities: • Contribute to projects across a *range of social innovation work* • Mentor fellow team members on *social enterprise, international development, and social sector challenges* • Contribute to the *spread of design thinking* in the social sector	In this position, you will be an integral *member of IDEO.org's Teen Reproductive Health program*, working to design solutions for improved access to sexual reproductive health care for youth across the globe. Your responsibilities: • Work closely with our partners to develop strategies, timelines, and pricing models that appropriately reflect their organizational needs, aspirations, realities and current business operations while balancing the needs of the end user. • Design organizational structures, strategic assets, and operating models to *help the company drive its own innovation*. • Create new ventures with an eye towards and *concrete plan for scale*. • Coach and teach other designers about *business*.

4.3.5 Design Support for Implementation

As is true of any consulting project, projects might not get implemented due to changes in funding, staffing, or priorities, or because of a need for more support in implementation:

> Funding is a huge [reason why projects might not get implemented] in this [social sector] field, specifically. Partners need to secure funding or have business strategies in place to perpetuate any sort of design. I also think sometimes, I mean, so many things can happen. There are a lot of different variables and components. It could be a shift in management or a shift in teams. It could be a shift in priorities for the organization; we've seen that a little bit too. Or organizations might be going in a different direction before they're going in the direction of our concept. Another one is they might not know how to evolve it so maybe will look to us to provide a little bit more support and help them iterate upon a concept after they've let it sit or used it for a few months and seen, "Hey, we're seeing this; we need to tailor it a little bit." And they might not know how; maybe they get discouraged. Maybe some of these I'm predicting and some of them I know are true, but it can be a variety of things. — IDEO.org Staff (S18)

Part of the motivation for shifting from the Project-Based Consulting Model to the Programmatic Model was to better support partners for a longer timeframe. By helping partners address challenges as they arise throughout implementation, IDEO.org hopes to have greater impact (S18):

> We offer ad hoc support to all of our projects and to all of our partners so that if they do get in moments where they need a little bit of extra creative vision or they need help thinking through the design of specific details as they relate to a specific concept, we're always here to do that as much as we're able. That's something we think a lot about: How do we continue to support the ultimate trajectory of a concept even though we ourselves are not implementers? Even talking to my friends who work in consulting (it's purely business consulting), that's also something that happens to them. I think it's something that we

commit to work on and I really… I'm biased, but I really believe and know that we go to great lengths to support partners when they need it. I'm sure that we could be doing more.

I think with the shift to programs, part of that was to think through how we could have even more impact on partners over a longer period of time. So like, how could we structure ourselves to be with them the whole time, for years potentially, to see these things actually up and running and be a part of those conversations as they're evolving? So that partners don't necessarily feel like they have to come back to us, but that we're sitting there with them. So I think that […] we asked ourselves that question [of why projects aren't implemented, and that] helped inform why we ultimately decided to focus a little bit in the program areas. Because it positions us to have even greater impact and longevity with these partners. — IDEO.org Staff (S18)

In comparison to IDEO's work for for-profit clients, a former IDEO.org Project Lead noted that social sector clients generally had less access to resources for additional design work during implementation (S21). IDEO.org tried to better prepare their social sector partners for implementation by providing concrete and comprehensive plans for launching pilots (S21):

[IDEO's and IDEO.org's] time constraints and money constraints are very different. The other main thing is a lot of times, on IDEO.org projects, the deliverable needs to be very actionable, very concrete because usually the partners with whom we work with don't have many resources to take that on or do extra design phases of their own. The output of those always needed to be the actual business plans and Excel models and vector files to print, and sketches of the space layout. […]

While at IDEO, a lot of times, the final deliverable is painting a picture of what could be. It's much more emotional, much more visionary, and less actionable. So I think it's a big difference in terms of what is required of the team to reach that point. At [IDEO].org we needed to be much more realistic, much more detailed-oriented, and much more concrete, which is tough sometimes. — Former IDEO.org Project Lead (S21)

For example, IDEO.org might deliver an implementation plan that consists of the customer experience, business model, branding and communication, job descriptions, and work plans:

We do a lot of work designing services, especially in our health-related work. For instance, in the Democratic Republic of Congo (DRC), we partnered with the American Refugee Committee to design Asili, a social enterprise that provides access to affordable healthcare, clean drinking water, and agricultural services for families in the DRC. What our design work is focused on is really the customer experience. So what's going to happen? How is someone going to find out about the clinic or the water or the agricultural services? What was their experience going to be when they used them? We did a lot of work on designing the business model. How is this going to be a sustainable social enterprise? How should the pricing and membership models be structured? We do a lot of work on branding and communication, so we worked with the community to name the enterprise, developed a mark for it, developed all the communication materials around it, and then actually really thought through all the operations and startup guides for how to launch this social enterprise. In that case, we were making recommendations on the type of people that would actually work in the clinic or the water points, putting together position descriptions for them, putting together work plans in terms of how they were going to roll out these first three ventures in the DRC. We do a lot of work like this. Our design work enables partners to launch social enterprises with the people they'll serve at the center. — Jocelyn Wyatt, Executive Director of IDEO.org (as quoted in Skillbridge, 2015)

One way that IDEO.org supports long-term partnership is through a series of design projects that help partner organizations navigate new roadblocks:

Clean Team, which has been around for years longer than IDEO.org, still has little bitty projects that gets scoped out to help them figure out how to continue to build onto their model and help them navigate different road blocks. I think that that long-term evolution of hitting ceilings and then crossing ceilings is

something that all of these projects are going to have. The life of a project is never just about that first point of engagement with the design team. There could be a need for multiple engagements with a designer or either as a consultant designer. […] There's going to be a need with these kinds of companies (like social enterprises and projects)… there's going to be need for ongoing engagement, whether it's scoping out discrete projects as they hit certain points in the projects. — Former IDEO.org Fellow (S17)

This longer engagement has been more rewarding for both IDEO.org's designers and partners (S16):

> [IDEO.org's Programmatic Model is] more rewarding and satisfying for people to be a part of, really from the beginning through implementation, which wasn't always possible with having a 12-week project. So I think our Fellows and our designers are really getting a sense of the importance of implementation, which wasn't as much of a priority before. It just wasn't possible for it to be. I think that's shifted the way that we think about the project timeline, that it's really not something you send off and you're done. It's this relationship that you foster throughout the course of many months and even years. I think when we have been able to do that and when there has been a great steward for the partner, that's when we've seen people come back to work with us. So I think there's definitely hidden value in doing that. It's both more satisfying for us and I think more satisfying for our partners. — IDEO.org Staff (S16)

4.4 Pivot from a Program with a Multifaceted Mission to Distinct Programs with Focused Missions

When IDEO.org was founded in 2011, the Fellowship program had dual goals of achieving impact through design education and design practice. The challenges associated with trying to achieve a multifaceted mission with a single program sets the foundation for understanding IDEO.org's transition towards developing distinct programs that focus on either design education or design practice (see Figure 4.3). The following sections provide an overview of the Design Kit and +Acumen HCD course as a resource and program dedicated to design education, as well as a description of the Amplify Program as a new model for practicing HCD for Social Impact.
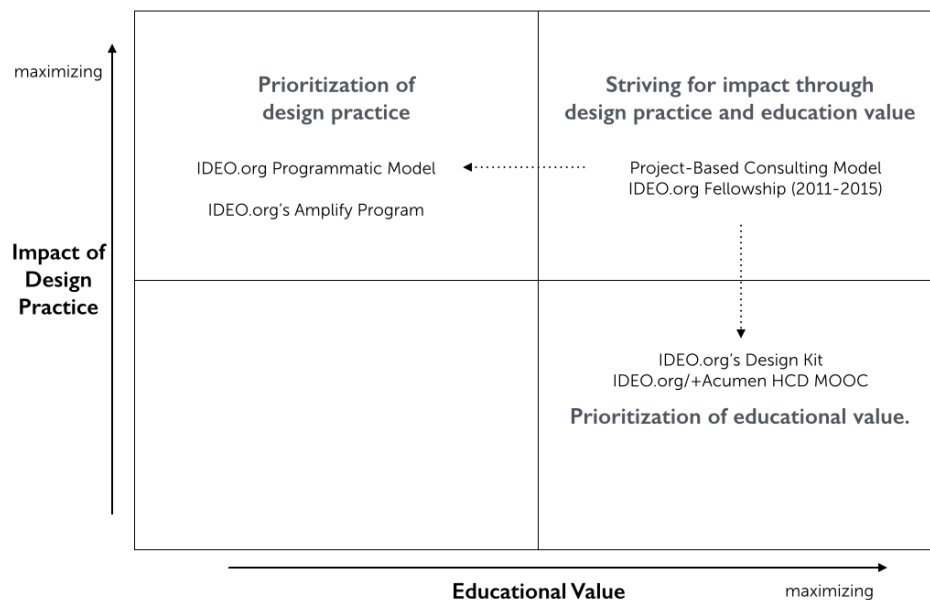

Figure 4.3. Evolution of IDEO.org from a program with dual goals to distinct programs for design practice and education

4.4.1 Design Education: Design Kit and the +Acumen HCD Course

To create a movement of design in the social sector, IDEO.org invested in additional resources and programs to address the goal of design education:

> I think the ethos of our culture is that you don't have the answer, but you have ways in which to find it. We know we can't do this alone, and when we think about the immense amount of challenges that we want to be affecting, IDEO.org will be small unless we get everybody changing their practice and thinking about people and trying things, experimenting, being involved. So we're investing in tools and platforms that can get that methodology out to the world. — Patrice Martin, Creative Director of IDEO.org (as quoted in Pastorek, 2013)

In September 2014, IDEO.org launched the Design Kit, a new online platform that "breaks down the methodology and the mindsets of human-centered design" (P. Martin, personal communication, September 19, 2014). In 2015, IDEO.org created a new Field Guide to help social sector innovators learn and use human-centered design methods (IDEO.org, 2015e). In June 2013, IDEO.org partnered with Acumen to launch a "Massive Open Online Course" (MOOC) +Acumen course on Human-Centered Design for Social Innovation (The IDEO.org Team, personal communication, June 20, 2013). As of Fall 2014, 40,000 people had enrolled in the course (IDEO.org, 2015b). Moreover, IDEO.org uses the Design Kit and the +Acumen course as resources to help partner organizations gain more familiarity with HCD before they start a project together:

> In terms of tools for capacity building too, we encourage all of our partners—I mean we've invested heavily in Design Kit and our Acumen course to try to get them up to speed before we start working together. — IDEO.org Staff (S18)

4.4.2 A New Model for Design Practice: The Amplify Program

With the Project-Based Consulting Model, implementing organizations would partner with IDEO.org to address a multi-week design project that they collaboratively identify and scope. The Programmatic Model represents a long-term approach for HCD consulting that aims for yearlong or multi-year partnerships with a series of design projects that can range from needs assessment to implementation and scale-up. With the new Amplify Program, IDEO.org has developed a new model for practicing HCD for Social Impact.

In February 2014, IDEO.org launched the Amplify Program, a five-year initiative with the goal of making international aid more collaborative and human-centered (S. Hewens, personal communication, February 13, 2014). Amplify is funded by the United Kingdom's Department for International Development (DFID). The Amplify Program is sponsoring 10 challenges on OpenIDEO, an online crowdsourcing design platform (OpenIDEO, 2015). To extend the reach beyond Internet users, IDEO.org sends design research teams into communities that it hopes to engage in these challenges, posts insights on OpenIDEO, and gathers feedback from end users:

> It's kind of a crazy idea to crowd source ideas around intractable problems. It's not something that OpenIDEO hasn't been doing, but we're going a little bit deeper maybe than they have in the past. We have a design research team that's going out into the communities that we're hoping to engage, trying to get to people who don't have access to the Internet. — IDEO.org Staff (S16)

The Amplify Program selects promising ideas from thousands of social innovators, designers, and social sector professionals, and provides seed funding and design support to

implement projects addressing ten design and innovation challenges. Whereas typical OpenIDEO challenges have sponsor organizations that will fund and implement the winning concepts, Amplify challenges start with no dedicated partner. IDEO.org is able to explore and select organizations that would be the best able to implement, and enhance their work with design support:

> We're able to do these [Amplify] Programs where there's no dedicated partner initially. We scan the field, we identify who we want to work with, and then we're able to prototype all of these different ways that we can either give them funding, give them design resources and design support, or just coaching, whether it's a Skype call or actually 12 weeks of work. So we're able to see where organizations are, what capacity they have, and then tailor fit this offering based on where they are at the moment. — IDEO.org Staff (S16)

IDEO.org is noticing that the +Acumen course is enticing users to participate in Amplify:

> We're seeing all of this secondary impact, which is really interesting to track. So somebody who maybe took our +Acumen course is then more intrigued to participate on an OpenIDEO Amplify challenge. We can see that we're building this movement in a pretty tangible way, which I think OpenIDEO hasn't had quite the success that we have just in the first two challenges with Amplify. — IDEO.org Staff (S16)

Tracking the outcomes of these programs and the influence of each or both of these programs for users is a new area of interest:

> It would be really interesting for us to develop a new way to track the impact of the Amplify and our +Acumen course. We know that there are like 72,000 who have taken the +Acumen course, but how are we going to track the impact of that course? How will we stay in touch with those people to see what comes out of it? So that's not something we've done yet, but I think it's something that we're really curious about, because we know of a few different examples of where […] those people have contributed to Amplify, and that's this great cycle, but we have yet to see like, "What if they actually take their idea that they developed in the +Acumen course into the real world and how can we be a part of that?" — IDEO.org Staff (S16)

4.5 Discussion

IDEO.org has a multifaceted mission of achieving measurable impact through design practice as well as design education. Initially, IDEO.org was addressing both aspects of its mission through its Fellowship program. Eventually, IDEO.org realized that trying to address the multifaceted mission with a single program was resulting in unacceptable tradeoffs. In restructuring their design consulting services to increase the likelihood of achieving measurable impact, it became clear that the Fellowship program was not the best way to serve that purpose. IDEO.org discontinued the Fellowship program, and developed the Design Kit and +Acumen HCD course, which focus on the design education mission, and the Amplify program which focuses on the design practice mission.

The changes resulting from the transition from IDEO.org's Project-Based Consulting Model to the Programmatic Model can be summarized using the Social Blueprint framework (see my revised framing in Figure 4.4). IDEO.org essentially shifted their Anchor Purpose to focus on the design practice aspect of their mission, which aligns with its core competency of HCD consulting. This shift in the Anchor Purpose necessitated corresponding changes in the other building blocks of the Social Blueprint. What follows is a summary of the tradeoffs inherent in trying to achieve impact through design practice as well as design education, and the changes in IDEO.org's Social Blueprint.

Anchor Purpose

Design Practice: To achieve measurable impact by addressing issues of poverty through HCD

~~Design Education: To "foster a community of future leaders with expertise in the methods and approaches of design thinking" (IDEO.org, 2012a, p. 6)~~

Key Partners

Parent organization: IDEO

Funders: Philanthropists, foundations, etc.

*Funders and organizations that support or work in reproductive health or financial inclusion

Key Activities

Partnership management

HCD consulting services through design projects

~~Teaching HCD mindset to Fellows~~

*HCD support throughout implementation

*HCD capacity building in social sector fields

Key Resources

Founders were the former leaders of IDEO's Social Innovation domain, and were uniquely positioned to gain support from IDEO

~~Fellows as design team members~~

*Permanent design staff

*Experts in program focus areas

Value Proposition

~~Project-Based Consulting Model:~~

*Programmatic Model:

*Trains clients in HCD to enable them to innovate and maximize impact

Delivers innovative concepts and implementation plans to help clients achieve their goals

Enables designers to create social impact through HCD

Improves quality of life for beneficiaries through innovative products, services, or programs

~~1-year Fellowship:~~

~~Enables designers to work in the social sector, with the security of returning to IDEO afterwards~~

~~Enables social sector leaders to learn the HCD mindset while achieving impact~~

Stakeholder relationships

Designers brought clients along on projects to help them embrace HCD

*Yearlong or multi-year partnerships with clients

Channels

IDEO.org's partnership team connects with clients through word-of-mouth in their professional network, internet, email, and in-person interactions

IDEO.org is not an implementer, and instead has indirect channels through partner organizations that work directly with beneficiaries

Stakeholders

Beneficiaries are low-income individuals and communities in the U.S. and developing countries

Clients are nonprofits, foundations, social enterprises, and corporations with impact interests

Designers with an interest in social impact

~~*Social sector leaders* with an interest in design~~

Cost

HCD project costs

~~Fellowship program~~

Differentiation *Expertise in HCD for social impact and program focus areas

IDEO's support (strong brand, network of donors and clients, expert design coaches, prototyping facilities, internal database of exemplary projects, etc.)

Revenue Streams

Fee-for-service for HCD projects   Project-specific grants

Unrestricted philanthropic contributions   *Flexible long-term funding

Magnitude

~~Water, sanitation, agriculture, health, financial services, gender equity, and community building~~   *Reproductive health   *Financial inclusion

Figure 4.4. 2015 Social Blueprint showing IDEO.org's discontinuation of the Fellowship program and transition to a Programmatic Model. Strikethrough text indicates discontinued attributes. *Blue text indicates new attributes. Regular black text indicates attributes that apply to both models.

Pivot from one-year apprentices to permanent design staff

The Fellowship program was well-suited for the design education aspect of IDEO.org's Anchor Purpose or mission. The Fellowship program aimed "to empower social sector leaders to use human-centered design as one of their many tools, and to then go back into the world into different sectors, use human-centered design as a method and tool in different communities, different social enterprises or organizations that may not have employed human-centered design before" (IDEO.org Staff, S16). The format of a one-year apprenticeship seemed to be successful in achieving this goal, although it also presented some challenges:

> I think we've seen a lot of them [IDEO.org Fellows] take different paths, and many different avenues after the Fellowship. And we've seen some who have stayed on the path of working in the social sector and then others who have taken pretty distinct detours. But I think the fact that we've been able to use many of our former Fellows in our current work as contractors and connect them to organizations that are also in our network speaks fairly highly to its success. I mean there have definitely been some setbacks for our organization or some challenges when it comes to having a Fellowship program, but by and large I think it's something that we've found to be incredibly refreshing for our organization, inspiring, and motivating in a lot of ways. — IDEO.org Staff (S16)

When IDEO.org shifted to focusing on achieving measurable impact through HCD consulting, IDEO.org discontinued the Fellowship program. Since the Fellowship program was designed as a one-year apprenticeship, Fellows would leave IDEO.org just as they had completed their trainings and were performing at their peak. In effect, IDEO.org needed to replenish and develop their Key Resources (their design teams) every year. This made it difficult to build expertise, and produce high-quality design, especially at the beginning of each Fellowship year. By discontinuing the Fellowship program and hiring permanent design staff, IDEO.org could recruit the best designers and domain experts and cultivate their expertise.

Pivot from a diversity of project sectors to programmatic focus areas

Initially, IDEO.org's Fellowship program was intentionally diverse, as it served the design education aspect of the Anchor Purpose or mission. The Fellows brought in expertise in different disciplines and experience in many regions and project sectors (e.g., gender equity, health, financial services, etc.). This level of diversity created rich opportunities for Fellows to learn from one another and through vastly different project experiences.

Although that level of diversity was beneficial for the educational aspect of IDEO.org's mission, it also meant that teams would be working on projects with limited or no prior experience in the sector. By focusing on reproductive health and financial inclusion as program areas, IDEO.org designers could draw from insights and experiences from similar prior projects. For example, IDEO.org partnered with the Consultative Group to Assist the Poor (CGAP) on various financial inclusion projects, and then co-authored a book about what HCD means for financial inclusion (CGAP & IDEO.org, 2014).

Pivot from design projects to long-term partnerships

With the Project-Based Consulting Model, each IDEO.org Fellow was able to work on three to four different projects during their Fellowship year. They learned by working with different team members and gained a breadth of experience by working across multiple project sectors. Although these eight- to twelve-week design projects were sufficient to develop

promising concepts and a pilot plan, IDEO.org found that partner organizations produced better results if they had additional design support throughout implementation.

By shifting from the Project-Based Consulting Model to the Programmatic Model with long-term partnerships, IDEO.org could increase the likelihood of achieving measurable impact. IDEO.org was also able to secure yearlong and multi-year program-specific grants, which made it easier to plan multiple design projects with on-going support throughout the implementation. The specificity of the program focus areas also attracted additional partners and funders from the fields of reproductive health and financial inclusion.

In the following chapter, I will describe how the International Development Design Summit (IDDS) evolved to better address its dual goals of design practice and design education with a Social Innovation Ecosystem of programs and resources. IDDS was deliberately selected to offer a contrasting situation to IDEO.org, and as such, has evolved through a significantly different trajectory and has uncovered a different set of themes than those from the IDEO.org case study.

Chapter 5

The Evolution of IDDS

5.1 Chapter Overview

"International Development Design Summits (IDDS) are hands-on design experiences that bring together people from all walks of life to create low-cost, practical innovations to improve the lives of people living in poverty" (IDIN, 2015f). IDDS originated as a five-week educational conference hosted by MIT in 2007. Each year from 2007 to 2012, various universities in the U.S., and abroad hosted five-week IDDS conferences that brought together a diverse group of people (e.g., mechanics, students, teachers, doctors, economists, priests, masons, and artists) to learn HCD and make technologies that "increase income, improve health and safety, decrease manual labor or save time" (Taha, 2011, p.3).

IDDS utilizes the Creative Capacity Building (CCB) Model. With roots in the appropriate technology movement and participatory development, CCB is based on the premise that anyone can become an active creator of technology, not just a recipient or user of technology (Taha, 2011, p. 3). According to the Director of IDDS, "we need to think of poor people not as vulnerable, but as capable. We have to think of it not as a billion mouths to feed, but two billion hands to engage" (as quoted in Bansal, 2014). IDDS emphasizes the importance of co-creation, or the concept that "innovation *by* and *with* communities is more effective than innovation *for* communities" (IDIN, 2015a, emphasis added).

From 2007 to 2012, IDDS organized a total of six IDDS conferences annually and developed an informal network of over 450 alumni from 52 countries (D-Lab, 2015a). Each IDDS conference brought together between 50 and 80 people from about 20 countries worldwide. During IDDS conferences, IDDS participants learn the design process through lectures and hands-on workshops, and apply these principles and skills on team projects. IDDS design teams visit partner communities to do user research, and co-create prototypes with community members. Each team is assigned a design facilitator who guides the team based on extensive experience in design or entrepreneurship.

Similarly to IDEO.org's Fellowship program (see Chapter 3), IDDS has the dual goals of achieving impact through design practice as well as design education. IDDS appears to be successful facilitating or stimulating personal transformations. Several IDDS alumni anecdotally attributed their dedication to social innovation or identification as innovators to their experience in IDDS. Yet, few IDDS technologies are being used by their intended beneficiaries and even fewer have been disseminated at a large scale. According to a former IDDS organizer, IDDS has

inspired people and built a network that has potential to produce innovations, but it has not yet developed products or services that have been shown to improve economic, health, or education outcomes at scale:

> As with any program or project, there has to be a variety of metrics. I think IDDS is successful on some metrics, but not on others. If one has to boil things down to one metric of contributing solutions that are making an impact on people's lives at any kind of scale, in terms of generating more income for people or significantly reducing time and labor for a significant number of people or helping to improve educational or health outcomes or any other kinds of metrics one could choose in the broader category of having impact on people living in poverty, then I would say that "No, IDDS is not achieving that objective."
> If the metric [were] on the inspiration side and engaging more people in this process and producing a network that has the potential to have that kind of impact, then I would say, "Yes, IDDS is accomplishing that goal." Altogether, I would say that it is a work in progress, that innovation is a long process. — Former IDDS Organizer (S3)

As a standalone five-week conference, IDDS was able to produce transformative changes in people, but much more time, support, and resources are needed to produce scalable products. An IDDS faculty member reflects, "Oddly enough, people can be transformed in a shorter timeframe than technology can be" (S2). To better support people in their growth as social innovators, and to better support social innovation projects, IDDS has been integrated into an interconnected set of programs that I will refer to as the International Development Innovation Network (IDIN) Social Innovation Ecosystem. IDIN was formed with a five-year $20 million grant from the U.S. Agency for International Development (USAID) U.S. Global Development Lab in 2012.

This chapter is organized into four sections. First, I present IDIN and IDDS's missions and elaborate upon their rationale for addressing both design education and design practice. Second, I provide preliminary results indicating that IDDS has been addressing its design education goal. I also present an overview of IDDS's Evaluation Framework for tracking progress towards achieving its multifaceted mission. Third, I provide an overview of IDDS's strategy for creating and empowering social innovators. In particular, I introduce IDDS's Social Innovators' Tribe and criteria for creating a transformative design experience as means for initiating and sustaining a commitment to social innovation. Fourth, by describing the evolution of IDDS from a standalone program to its integration into IDIN's Social Innovation Ecosystem, I present one possible strategy for trying to address a multifaceted mission of achieving impact through design education and design practice.

5.2 The Mission of IDIN and IDDS

The International Development Innovation Network (IDIN) was founded in 2012 as an organization with multiple programs and initiatives. IDIN manages the International Development Design Summit (IDDS) program and supports volunteers in organizing IDDS conferences. In this section, I will discuss the respective missions of IDIN and IDDS.

IDIN believes that creating and supporting a global network of change makers or social innovators (in bold below) will result in technology innovations that will address challenges of poverty (in italics below) at scale (underlined below):

> If you read our goal on our results framework on our wall, "Our goal is to create and build a **global network of change makers** that enables the design and development and dissemination of *innovations that address key development challenges of poverty* while building capacity in communities for local innovation and creative problem solving." Essentially, we put the people first. We are building a network of change makers first and that enables the creation of technologies. But we are not creating technologies and neither are we putting that first. The purpose is to create change makers. — IDIN Staff (S11), emphasis added

> [The mission of IDIN] is to launch a **global network of innovators** from a variety of sectors who embrace a particular approach to design that emphasizes co-creation and intends to engage with communities in figuring out how to solve intractable problems, specifically related to poverty. The goal is to utilize their skills and their creativity and their talents for <u>solving problems (not only for themselves but also for other people), and then to figure out if their solutions are broadly applicable</u>. The concept of the network is where the ideas can circulate. And so, by definition, the goal is to have an exchange of ideas, and exchange of solutions, and exchange of problems that ultimately produces *technology innovations that will address intractable problems related to poverty*. — Former IDDS Organizer (S3), emphasis added

> [The mission of IDIN is] to support a **global network of innovators** to bring *technologies that solve problems in poverty* to <u>scale</u>. — IDIN Staff (S1), emphasis added

According to an IDDS faculty member, the mission of the IDDS program is more focused than IDIN's mission, and essentially entails "bringing people to development through design, entrepreneurship, and technically-oriented approaches to change" (S2).

The following sections will review the interconnectedness of design education and design practice in IDIN and IDDS's missions, define innovation, and clarify the goal of reaching scale.

5.2.1 The Interconnectedness of Supporting People and Products

IDIN and IDDS staff members often discuss the challenge of balancing design education with design practice. It is common for IDIN and IDDS staff to refer to this dichotomy as "innovators versus innovations" or "people versus projects/products/technologies." IDDS staff members use the terms projects, products, and technologies somewhat interchangeably when referring to the apparent dichotomy in their mission. To clarify, IDDS *projects* are the set of activities IDDS teams engage in to address design challenges. IDDS hopes that some projects will produce *products*, which are solutions that have been developed to the point of benefiting users, and may perhaps be sold or otherwise disseminated. Although most IDDS projects focus on *technologies*, typically involving the manipulation of materials to perform an intended function or purpose, some IDDS projects involve processes (e.g., training) or services. Although both sides of the dichotomy are essential components of the organizational and programmatic mission, IDIN and IDDS ultimately prioritize design education over design practice:

> We talk about IDDS, and therefore IDIN, as being about innovators and innovations. I am certainly biased under the innovators (people as opposed to technologies or devices). […] Technology is a significant part of it, but we are not doing technology for technology's sake. I think the long-term idea about impact or sustainability or just change or the theory of change is that: Changing people leads to changing the world; but changing technology or developing new technology or technological change also changes the world. But, maybe it's not the kind of change we are after. That is not our mission, to create lots of technologies. — IDDS Faculty (S2)

> At IDDS we have two things happening simultaneously: we have projects, and we have creative capacity built within people. This is always a debate within IDDS. Over the last few years, what we have determined is that fundamentally, [IDDS] is about building the capacity of the people and the community members who participate. However, projects are the vehicle through which this happens. We do try to periodically

make sure that we remember that the IDDS experience is about empowering the participants and community members that engage in it. It's not just a technology hackathon. It is about what is happening to the people there. It is the education that is happening at IDDS; it's our biggest take away. (Smith, 2015a)

There is this constant conversation that happens every single day in the IDIN, which is people versus products. Are we about people or are we about products? You know the answer is that we are about both, but at our core, in our deepest parts of our souls, we are an empowerment program. — IDIN Staff (S11)

According to the Director of IDDS, design projects are the mechanism that IDDS uses to teach people the design process:

IDDS is about teaching people a design process. The project is the mechanism we use to do this. You can always come back to the point that, "We're teaching you this process so you can apply it to any problem at any time." So what's important is that we recognize how to make a problem framing tree, and how it can help us look differently at a problem, and how it can help us focus and define what problem we're working on. What's important is that we learn the problem framing tree and how to use that method in other areas. What's important is that we learn idea generation techniques and that we'll use them in other areas, that we learn the concept evaluation tools and we learn how to do it in many applications. — Amy Smith, Director of IDDS (Smith, 2015c)

According to the Director of IDDS, teaching people the design process is more important than making any particular technology at IDDS (Smith, 2015c). IDDS hopes that participants will continue using the design process and tools in other endeavors after the IDDS conference:

We're [IDDS is] a spark that is going to lead to multiple beautiful flames around the world, where people are going to be using the design process, maybe to keep working on this [IDDS] project, but more likely to work on another project. What we want to do is to teach them the process so that when they're somewhere else working on another project, they're doing it well with tools that they used engaging people in a thoughtful way to move that project forward. So don't forget, our main point is teaching people how to use tools, not just how to make this particular thing. When we do a Built-It module, we teach people how to cut wood to make a charcoal press, but we want them to cut wood to make a chicken coop, to make a pedal-powered coffee de-husker, and oil press. We want them to use these skills in many different things. — Amy Smith, Director of IDDS (Smith, 2015c)

IDDS has had positive results with IDDS alumni self-reporting increased involvement in social innovation. Although IDDS has been more successful at achieving their people-oriented goal, they cannot drop their product-oriented goal to focus solely on people. In order to secure funding to support people, IDDS believes that it must develop products with a measurable impact. Conversely, IDDS believes that it must also support people in order to have the momentum and commitment needed to product impactful products. IDDS believes that it must maintain its dual goals of people and products:

I am not going to say that people are thinking of products simply because they are thinking about funding. I am going to say that, for those within the [IDIN] Network who say that we need to focus on the people, if they do not recognize the importance of generating products that are identifiably having an impact and how that ties to the funding, they will not have the resources to provide the support for the people they want to support.

If it is the people who say, "It's all about the products," and fetishize the products, and focus on that alone and then get the money, they are not going to have the people and the innovators in the network. They will lose people. People are going to go and do other things.

It is so easy to get back into your life. You go to a summit. You get engaged. You are living with people for four to five weeks. Of course, you are going to be all in it, excited and motivated when you are together. But when you go back to your life, it is a little more difficult. If there is limited support,

> connectivity, and understanding of a clear pathway, I think people quickly go and do other things. Then, you are not going to end up with the products you want. — Former IDDS Organizer (S3)

To summarize, there must be a dual focus on people and products. Individuals and partner communities participate in the IDDS conferences because they are expecting to work on a real project with real potential for social impact. The projects are a vehicle for learning and personal transformation. Projects must also have some potential for positive social impact to provide the authenticity needed to morally engage with partner communities. Projects with some potential to scale also attract the funding necessary to support the people. Although IDDS projects may not become scalable products, IDDS projects are the means to build the network of people that will eventually produce scalable innovations:

> Overall, the IDIN theory of change is if we create a network of innovators and support this network of innovators, they will work together to solve problems via innovation, and those innovations will go on to impact many many more people. — IDIN Staff (S11)

5.2.2 Managing Expectations about Innovation and Impact

The challenge of balancing people and product plays itself out at the heart of the IDDS process in the selection of projects. IDDS strives to select projects that are innovative and impactful:

> Designing for impact and innovation is a tool that helps visualize what IDDS thinks is important. At IDDS we strive for impact. We are designing technologies that have impact. We are trying to produce things that are innovative, but not trying to disseminate existing technologies. We are not saying that disseminating technologies is a bad thing to do; it is a good thing to do. But in our [IDDS conferences], we want to focus on doing things that have a large potential impact. […] You don't want low impact and no innovation. If there is impact but it's not innovative, be innovative and increase impact. If it is innovative, think about how we can use that innovation to create impact. (Smith, 2015d)

IDDS's definition of *innovative* means new to the design team or new to the community, but not necessarily new to the world:

> Innovation is not that a product is something that is brand new to the world, but it is brand new to the community where it is right now. So even if something has been around for 100 years, if it has not been introduced to you, then it is innovative to you. That is the framework we are looking at it in. — IDIN Staff (S11)

> A lot of projects are not inventive, necessarily (most of them). But they are very innovative for the community, and they are very innovative for the team, and the whole process of how the team gets to it. — IDIN Staff (S1)

Projects that use existing technologies and proven dissemination models may have a likelihood of producing a positive impact in partner communities. However, IDDS does not consider projects to be good projects if they do not provide opportunities for innovation because they would not be good vehicles for learning design and entrepreneurship:

> "What constitutes a challenge in development?" and "What's an appropriate challenge to engage community around? Is it something practical, tangible in the community?" Like, they need more latrines. There is maybe not a lot of innovation in that. There's maybe not a lot of design or entrepreneurship challenge in that. But this specific community could get a latrine in five weeks and we could get that happen. — IDDS Faculty (S2)

It is difficult to find a project that addresses a need in IDDS's partner community, has high potential for scale, and also provides opportunities to learn about design, entrepreneurship, and technology. With limited time and resources to assess the potential scalability of projects before IDDS conferences, several IDDS projects tend to serve as vehicles for learning or focus on serving a particular community:

> It is still better to do a project that people will care about and it matters to the communities. Because of the timeline, you just have to pick something and go with it, but if we were more interested in the projects being better [and having greater potential to scale], then there could be more front-loaded stuff to be more informed or have better informed decisions for that, even figure it out beforehand. Have it be slightly less open-ended than it is now. — Former IDDS Organizer (S4)

Although IDDS organizers believe IDDS projects should have the potential to have a positive social impact, there are limited resources available to make that a reality. A former IDDS organizer emphasizes the responsibility that IDDS has to either invest in the resources needed to enable every project to succeed or to be transparent to communities about what IDDS is able to do:

> I think [IDDS] wants to respect people's time, their energy and their resources. They want people who are on teams to feel like they have an opportunity to make a difference. Everyone is held up to a standard during the summit to be asking themselves: How does this thing survive? How does this thing live? What is our business model? How do we think of this not only as an abstract exercise?
>
> If IDDS wants to [focus solely on education], it needs to reconsider its engagement with the communities. And, it needs to be explicit that this is for us to learn. And then, you learn and then, you go, and you do whatever you do. But if we put it forward as we want projects to succeed, then we have to put the infrastructure in place and invest in time and people and curriculum to make it possible for every project to be real. — Former IDDS Organizer (S3)

An IDDS faculty member presents an alternative perspective. In the practice of design, entrepreneurship, or innovation, uncertainty and some degree of failure is inherent (S2), and there is an implication that not every project will succeed:

> If you are steeped in design and entrepreneurship, you believe that not all projects will be successful, not all prototypes will be the right prototypes. It is an iterative, learning, felt process. — IDDS Faculty (S2)

For most IDDS conferences, there is no pre-specified goal for the percentage of projects that will succeed. In 2015, the Lead Organizer for IDDS Aarogyam in India noted his personal vision for 50% of projects to be continued and 50% of participants and organizers to support community-driven projects:

> Real success for me would be to see at least half of the projects going forward. I hope HIVE InnoSpace [an IDIN Innovation Center] can take (the projects) to a place where (IDIN Network member) Stephen Gerrard has taken JustMilk [a nonprofit resulting from an IDDS project] or Zubaida [former IDDS participant and organizer] and I have taken ayzh [a for-profit social venture] to. Another thing for real success would be to see at least 50 percent of the participants and organizers supporting community-driven projects. A final wish I have for at least this group, if not the entire IDDS crowd, is it becomes an engaging community for life, not just for a few years. — Habib Anwar, Lead Organizer for the 2015 IDDS Aarogyam in Chennai, India (as quoted in McKown, 2015e)

Regardless of whether one believes it is possible for all projects to succeed, programs that teach design, entrepreneurship, or innovation by partnering with communities must be especially careful in managing expectations. Educators, learners, and community partners must be transparent about priorities, risks, and potential benefits. It is important to be clear to participants and partner communities that they may be engaging in a project that may not go beyond the project-stage:

> I think [community buy-in] is something that is interesting because it is hard to get community members really excited about a project and then not give them a solution to it. You have to manage expectations. You cannot say you want people to say, "I'm excited about working on this." You even want them to understand that at the end of four weeks, you are not going to solve this problem. We are taking a stab at this. We are hoping to learn from this, and go forward with this.
>
> We have community members asking us, "We worked on this project. Where is this project now? What happened with it?" Then you are like, "We learned something, but we haven't really had an impact through this project that we worked on." We worked in [names of partner communities]. We don't want to burn these partner relationships by having projects that are really engaging and they are really counting on us. We need to be careful about how we express ourselves. — Former IDDS Organizer (S6)

An IDDS faculty member elaborated on the importance of managing expectations so that participants and partner communities understand that the five-week conference is an opportunity to start to explore possibilities, and that much more work and time would be needed to produce products with measurable impact:

> Hold on, it's a five-week event. So what can we expect of this? I've gone so far as to say to people within IDDS in our conversations, is to be careful about the project and what we say about it because it can be effectively a bait and switch. Come do a project with communities and people come to the summit to do that. But let's be realistic about what can be achieved.
>
> We can be like, "Wow, people have had this great experience and they have been transformed. We are not so concerned about those projects." So that is a bait and switch for people because you are going to come to the event and say, "Hey, we are going to talk a bunch about doing development. Want to do that?" And people will be like, "Wow, really? [skeptical tone]" But you say, "We are going to work with communities on real challenges and try to solve them and try to make a difference." And people will be like, "I want to show up for that." But, if they are told that too literally and they do not appreciate…
>
> What is the real scope of the effort and the potential here? It's really about starting something. It's not about following anything through. It is about starting stuff, and finding possibilities. Possibilities are exciting. They matter, but don't oversell it. There is a certain potential for a bait and switch. — IDDS Faculty (S2)

Some former IDDS organizers expressed concern that some IDDS participants or partner communities might not understand that IDDS is primarily an educational experience and that some IDDS projects may not result in viable prototypes:

> The branding that we do for participants make them think that they're there [at IDDS] to make prototypes. Especially when one or two groups are behind other projects at the summit, and they know that their other colleagues or participants are actually creating something or are ahead in the process, the participant experience starts to decline. I think we can do a better job with the participants if we are very clear right from the start to participants. — Former IDDS Organizer (Smith, 2015a)

> I don't think it is ethical to go into communities and tell them that you are going to come up with a refrigerator and have them invest their time and energy in helping you figure out the design requirements for a tomato-refrigerator and then at the end be like, "Oops, sorry, we were just learning." Too frequently, service learning projects are more about the learning than about the service. I think that the bar has to be super high if you are going to go and learn in a community. I think that people in IDDS would

agree with that if you had that conversation with them. Whether IDDS is doing that in practice or not is another question. And in my view it is not doing that in practice. I think that people are set up to believe that they are going to be working on the next thing, that it may not be a big thing like D.light, but it is something that may have impact in that particular area and in that particular community and that it can be a real thing. — Former IDDS Organizer (S3)

If people learn the [IDDS] curriculum but they are not excited by it, they are not going to do it. What we do is try and get them excited and give them the tools and say that this project might not be the project, but when you go home, you will work on a more impactful project there. I think that the curriculum is trying to give the people the tools. So even if that project is not the project, they can eventually get to that point.

I always think that it's not fair to participants. It is not clear to participants that we might be thinking that way. They think that that prototype [for their IDDS project] is the thing I need to not sleep to do. […] I think it would be nice if we said it upfront. I don't know. I don't know the right way to do it. I don't want people to really struggle and feel really bad. But at the same time, the projects are in real communities with real people so they do need to care. I don't know. It is super tricky. — Former IDDS Organizer (S4)

In training videos for IDDS design facilitators, the Director of IDDS emphasizes the importance of reminding participants that IDDS projects are a vehicle for learning:

Multiple times, as the instructor, I've talked about how this is a learning journey and the projects are the vehicle to take us to our destination. People don't always hear that. There are ways to reinforce that and the biggest people to reinforce that are the design facilitators. Because I think when it comes across to the group as a whole, it's not heard as much as when the design facilitators reinforce that. So I think it's an important thing. That being said, the participant experience is enhanced because of having a successful project so you can't say it's not about the projects because to a certain degree, it is. We also work hard to select projects that are appropriate for the community where we're working on them, that can have an impact. And so we have a definite bias towards trying to do good projects. So it is a tricky thing. — Director of IDDS (Smith, 2015a)

The dual missions of IDDS thus create the need to find a balance in the ways in which they communicate with the participants in their programs and in the choice of projects they undertake.

5.2.3 Clarifications about the Goal of Scalable Products

Communications around the IDDS missions are made more difficult by the fact that different stakeholders within IDDS have different perspectives about the importance of scale. According to an IDDS faculty member, the importance of IDDS projects reaching impact at scale depends on the mindset of IDDS participants. Some participants expect to have an impact at scale and would not consider their experience to be successful if their project did not reach scale. Others may consider the experience to be successful if their project benefitted a single person or community. Meeting or managing the expectations of participants is important because participants must feel like their experience was authentic and successful in order for personal transformation to occur (S2):

A good dimension that [the requirement for scale is] conditional upon is the nature of the participants. People come to the summit with different expectations. They know there's a project and engagement with communities; they've heard. They start to have certain expectations about… What they are doing there? And is it worth it? Or did we do something significant? Or we get back to that notion: Were we successful? And since it is a finite time frame for processes that can take longer, you can think of it as "Did I engage in something with the potential for success in this space of poverty that I care about, that is purposeful for me?"

> Some people come to the summit - it is important to them that they could be engaged in a bigger story that involves larger impact that can maybe involve scaling, and so on. Some people who come to the summits are like, "Scale is not a requirement at all for this. Having an impact in this community is actually in itself sustainable and makes a tangible measurable difference. It is so worth it and such a success that I am perfectly happy with that. No scaling required."
> To a certain extent, what the expectations and mindsets that people come with are not all the same, and they believe different things. They may not have the experience or the transformation because they may not decide it is authentic or they may not decide it is successful. — IDDS Faculty (S2)

The same IDDS faculty member suggests that perhaps scaling is not the goal, but rather that IDDS supports projects in a way that they can be continued until results suggest that there is insufficient potential or that more resources should not be invested. Moreover, it may be unreasonable to expect that a project would produce a scalable innovation in only five weeks, especially when the majority of the program is focused on education and personal transformation rather than developing scalable technology (S2):

> We are still learning as an organization how to have a part of the programming and part of the process support the potential for those things to go forward to their natural outcome or some follow through, be it scaling or not. The more basic question is, not whether any of them even scale or not, but whether they were even followed through.
> It would not hurt to have things that scale. I think there is an odd discontinuity here about scaling. The summit is a five-week event, where we are not even leaning the majority weight on the innovation or technology side. — IDDS Faculty (S2)

On the other hand, USAID (the primary funder of IDIN and IDDS since 2012) emphasizes the importance of IDDS projects reaching scale. Before partnering with USAID, IDDS primarily focused on inspiring and empowering social innovators. IDDS has since shifted more towards supporting IDDS projects to increase their potential for scale. There is a persistent tension between prioritizing people or products because different stakeholders have different priorities:

> Our [IDDS] program exists because of USAID, whose mission is to create technologies that are going to change the game in development. […] [Putting social innovators rather than technologies first] sometimes can be competing when our success is measured by our donors by counting the number of amazing products we come out with. Whereas we think it is really awesome when two to three guys in the community in Tanzania are working on an avocado press. We think that is the coolest thing ever and that means that those people who thought that they were not innovators are now innovating and building new prototypes everyday. And USAID says, "Yes, but it's not scaled so it does not count." To us, that is empowerment and that is leadership and that is innovation happening. So it can be a battle. — IDIN Staff (S11)

The tension between those who desire scalability and those less concerned about it is resolved to some extent by a shared sense of the overarching commitment of the organization to social innovation.

5.3 Sustaining a Commitment to Social Innovation

IDDS's overarching goal is to inspire and empower participants to be social innovators, regardless of whether that ultimately involves development, design, entrepreneurship, or technology (S2):

It [IDDS] is a program about empowering people to make change in the world. Whether they do that in designing products, whether they do that by becoming community leaders, whether they do that through studying international development and becoming NGO presidents, whatever. The point is empowerment and people believing that they are innovative and that they can solve problems. — IDIN Staff (S11)

One of the greatest achievements of Zambia 2013 was the number of Zambians who went back to their community and started teaching people about what they had learned at IDDS. That is something that is really important about the summit: the ripple effect that happens after IDDS. It is not only the people living in the country where the summit takes place, it is also those students who go back to their university and start a chapter of Engineers Without Borders, or someone like [an IDDS alumnus] who decides to go back and become a professor at a university that is doing this type or work. Most of us have taken what we learn at IDDS and synthesized it and found a way to move forward with it. That is what we want to make happen. People are transformed by whom they meet, what they do, and how they work at IDDS. This influences what they do when they get back home. It can be in multiple ways. It's not necessarily in one way. That is what we mean when we say we want to empower people. — Director of IDDS (Smith, 2015a)

This is not just specific to how I think about what we are doing, but we have shared among a lot of IDDS or IDIN people, which is that: part of the shift we are looking for is people to have the thought (at least, if not the result) that they might be part of making change in the world, that they have a role. — IDDS Faculty (S2)

IDDS faculty and staff refer to the personal transformation that IDDS stimulates as putting people on the Social Innovation Pathway or furthering people along that path. However, each person's exact path is slightly different because of his or her prior experiences:

We mesh their reality, their life with the [IDDS] experience, and what comes out is something different for every person because the experience is not quite the same for every participant (you cannot make that happen), similar, but not the same. Of course for every person, it is different; and, they bring something totally different to it. So effectively, it is a different outcome for every person. — IDDS Faculty (S2)

When asked whether the intention of IDDS is to help participants identify as "designers," an IDDS faculty member reflects upon the different types of shifts that could happen:

I would even say that designer or entrepreneur might be too strong, because they name things and those words have baggage in ways that I am not sure that those people [IDDS participants] would use. They might come out of the summit saying, "I am now a designer. I believe that I am designer." They might say, "I believe I can do design or I just did design." They might even say, "I don't know what the word design means still." So it's hard to labels on and words to describe it. […]
To some extent, a lot of people coming to the summit self-select. They presumably care about development already and are pretty interested and are biased in some direction. So the change we might actually be making is: people depending on where they came in, where did they stand, where did we move over from. So for some people it is like "I was not sure I am going to be a part of development, take some kind of action, and engage in some way in the community in some form." To people who are engaged, it might change how they are engaged. They might bring more design and entrepreneurship into what they do. Some people were getting on the path, and some people are on the path. So if you are moving them further down the path it is different than getting them on the path for the first time. — IDDS Faculty (S2)

We have people like [an IDDS participant] from Kenya. We have been talking to her and thinking about her role in the summits. She comes to it as a young person not totally clear about where she is going in the world. So for this is about getting on the path or staying on it or isn't solidly on it. And she needs options to keep her on it. She is not sure-footed. Or other things might come along or she might run out of time or runway to stay with it.
There are people who literally come to the path. There are people who show up and they literally say to us, "I don't know why I am here." They literally say that, "You said I should come, and I believed you.

And I get here, and I see what this is and I'm like I don't know why I am here. Frequently, later in the event they are like, "I know why I am here."

So some people are very much at that level that: "I'm not sure what this has to do with me. What are you people? What are you doing?" Some people like [an IDDS participant] are there, who are on the path, but they are not sure-footed. And then there are people who are totally on the path. And we are like, "It's not clear why you are here." They do not necessarily need us. They are looking to deepen their expertise. — IDDS Faculty (S2)

A lot of people just need community; they need a place to be where there are other people like them. It is tribal, and some are at the summit because this is their tribe, and so they need to be here. It is not clear why they are there, but being with your tribe is important. And it is valuable. And some people are here for that. — IDDS Faculty (S2)

Based on these descriptions of what the "path" might be for various IDDS participants, I developed a visual representation of IDDS's Social Innovators' Pathway (see Figure 5.1). The figure depicts the spectrum of goals a participant might want to achieve, from the beginner who wants to dip a toe in the water and learn something about social innovation to people who just want to "be with their tribe" and seek opportunities to change the world. Participants can start in many different places. They may be experienced entrepreneurs who want to learn more about design and international development. Or, they may be highly experienced in international development, but want to learn more about design and entrepreneurship processes. Or, they may be a beginner in all three.

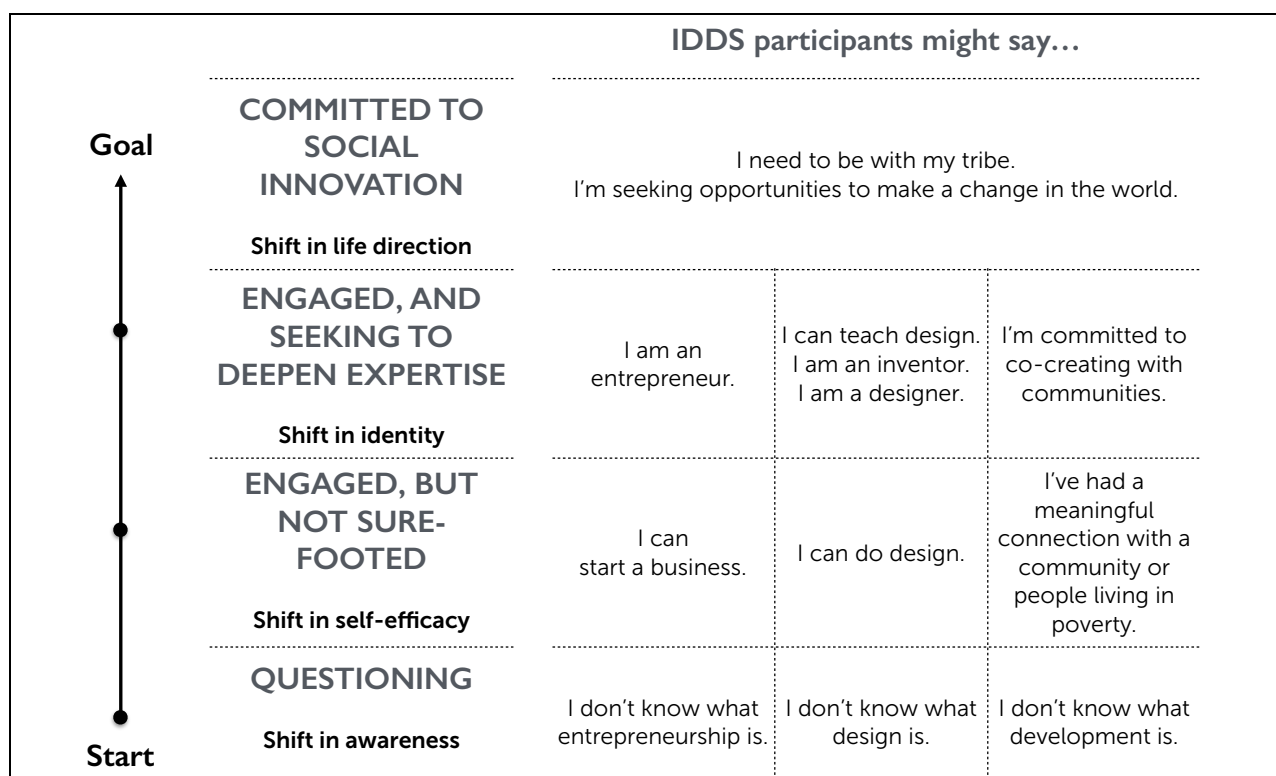|	IDDS participants might say...		
COMMITTED TO SOCIAL INNOVATION **Shift in life direction**	I need to be with my tribe. I'm seeking opportunities to make a change in the world.		
ENGAGED, AND SEEKING TO DEEPEN EXPERTISE **Shift in identity**	I am an entrepreneur.	I can teach design. I am an inventor. I am a designer.	I'm committed to co-creating with communities.
ENGAGED, BUT NOT SURE-FOOTED **Shift in self-efficacy**	I can start a business.	I can do design.	I've had a meaningful connection with a community or people living in poverty.
QUESTIONING **Shift in awareness**	I don't know what entrepreneurship is.	I don't know what design is.	I don't know what development is.

Figure 5.1. My visualization of IDDS's Social Innovators' Pathway

5.3.1 IDDS's Preliminary Results

Given both the tension around whether or not the output of IDDS projects should be scalable, and the wide variety of goals that participants wish to achieve, measuring the effectiveness of the conferences can be challenging. During IDDS conferences from 2007 to 2012, all of IDDS's assessment efforts had been for program improvement purposes and focused on collecting qualitative data about participants' experiences. Anecdotal evidence suggests that various IDDS alumni have moved further along the Social Innovation Pathway (see Table 1.2 in Section 1.3). Some IDDS alumni develop technologies or social ventures, whereas others volunteer to organize an IDDS conference or conduct training courses or programs based on the IDDS curriculum:

> We also see evidence after the [IDDS] event about what people do in their lives. What happens? Some people slip right back into where they were heading already on one end of the continuum. Some people are in the middle of the continuum. The faculty members, they still teach. They have a pretty structured life, and they have a lot determined for them, but what they do in that space has changed, they teach a lot of different classes.
> We see students change degrees. We see people who run ventures, or they are engaged in technology and train other people. We see people training other people. We particularly see a lot of people going, "This experience was amazing for me, I want other people to have it: people in my community, people in my country. I want to run a summit." Or even two- or three-day workshops where they take the material and just do it again. There is this kind of wishing for others what happened to you; enough that we can conclude something about the transformative effect that happen. To say that, "I want to transmit what I have received." It is a certain kind of hope and a certain kind of gratitude. — IDDS Faculty (S2)

Since IDDS was volunteer-run, "there was no holistic or longitudinal approach to (1) storing, comparing, and using this data over time; or (2) following up with past participants and projects" (J. Repishti, personal communication, September 29, 2015). When IDIN was founded in 2012, IDDS began to strengthen its monitoring and evaluation efforts in response to reporting requirements from USAID, the funder for IDIN. Full-time IDIN staff developed a monitoring and evaluation plan to be able to compare data across multiple IDDS conferences over time in terms of their "targeting, delivery, short-term and long-term outcomes, and to track needs over time" (J. Repishti, personal communication, September 29, 2015).

One strategy for exploring the needs of IDDS alumni and long-term outcomes of the IDDS conferences was an online survey of IDIN Network members. The following data was collected by IDIN's Network Coordinator and analyzed by a research assistant in 2014 (J. Repishti, personal communication, February 25, 2015). Out of the 425 Network members, 264 members (62%) responded to the survey. Sixty-six percent of survey respondents (174 people out of 264 respondents) self-reported that they had worked on a development-related project. IDIN staff reviewed the 174 qualitative responses and categorized them into three categories: 68% appropriate technology, 18% teaching/training, and 14% other. Sixty percent of respondents had been active in alumni network activities in the past six months, and 80% of respondents were interested in volunteering for IDDS or IDIN.

The respondents to the 2014 IDIN Network survey also reported that they were actively working on a total of 50 projects. The following data was self-reported by respondents about these 50 projects:

- 24% were IDDS projects
- 8% had more than one iteration
- 53% reported student engagement
- 60% reported IDDS collaborators
- 49% received mentorship/support from network
- 35% received advice or support from IDIN staff
- 33% received IDIN funding
- 45% received external funding

These data suggest that there are some IDDS participants working on development-related projects, which either originated at IDDS or received some form of support from IDIN.

5.3.2 IDIN's Evaluation Framework for IDDS

IDIN is conducting a more comprehensive Monitoring and Evaluation effort that will be completed by 2016. IDIN plans to track three types of outputs and outcomes: participants, projects, and community engagement.

Tracking Participants

IDIN conducts surveys before and after each IDDS conference. These surveys of IDDS participants suggest that IDDS is resulting in shifts in knowledge, skills, and attitudes. However, the outcomes are different depending on the participants' baseline prior to IDDS and their particular IDDS experience:

> Certainly everyone takes away something different. Everyone is coming in with a different level of experience and education in this realm. Some people come in with a ton of training already and maybe they come out with a changed perspective. Other people come in with no training and come out with a lot of training. I think that everyone takes something away and that is expressed in the surveys we do.
> We do do some learning questions at the beginning and when people leave as well, and we see that people are learning along the way and people also tell us that "This is what we took away." This happens in three realms: here is what I learned, here is the knowledge I gained, here are the skills I gained. They also say, "This is how my perspectives and attitudes have changed." So it is a little bit separate, knowledge, skills, and attitudes. But self-reported-wise, people say that they took a lot away in addition to what we are able to measure via test questions. — IDIN Staff (S11)

Tracking Projects

IDIN assesses projects based on two measures of success. The first measure is based upon project continuity by either IDDS participants or community members. IDDS assumes that projects that are continued are those that address a need or demonstrate potential for scale (IDIN Staff, S11). The second measure is based upon how far the project goes into the market, and is categorized in four phases: development, pilot, early adoption, and scale (IDIN Staff, S11):

> The output is a project. The outcome is that the project continues. In order for a project to go from just being a project to a project that continues and is successful, there are some assumptions for assuming that the project is good or assuming that it is needed or assuming that it has potential to be adopted by this community. — IDIN Staff (S11)

> The first measure of success [for projects is] that it continues and that people are still working on it. You can think of it in two different ways, 1) our [IDIN] Network members are still working on it 2) the community is working on it. Those are two different measures of success. Whether the original team or the Network people want to work on it or other people in the community continue to take it on. So that is one

measure of success: that there is some continuity and some enthusiasm for it. Another measure of success further down the road is how far the project scales.

We have four [project] phases we think about. The first is development, which is what happens at IDDS when you are developing a prototype. The second phase is piloting, which is kind of a more official, "Ok, we are going to give ten people this product, and we are going to conduct a series of interviews (or however we want to conduct the research), and then we are going to write a report that here is what we found out, and here is what we are going to improve." That is a phase. Not every project does a pilot. The next phase is early adoption, so some people are starting to buy or use it, and it is not just the inventors, but real people in the world want your product. So early adoption is when a few more people are using it. And then the next level is scale. Where lots of people are using it. Scale means something different depending on the project. If it is an app, you need a lot of people to consider it scaled. If it is an irrigation pump then if fewer people are using it, you can still consider it scaled because it is being used. So this is another measure of success.

So there are two dimensions to it, it is engagement and continuity and the people who are pushing it forward, and the other measure is how far it actually goes in the market. We can look at other things like has it received funding from other groups other than just IDIN, whether they received funding from other investors or other awards. We do track that stuff, as well. — IDIN Staff (S11)

IDIN also tracks projects that it has supported. IDIN supports projects that IDDS participants are developing if the projects are related to design, technology, and entrepreneurship, regardless of whether the project was an IDDS project:

We only track them if we have supported them in some way. For instance with [an IDDS participant's social enterprise], so IDIN provided her with a Scale-up Fellowship of $20,000 as part of the scaling of that. So basically, we actually do have a lot of alums who apply for funding for other projects that were not IDDS projects. And if they receive funding, mentorship and support from us, those resources have gone towards that innovation, and it is an innovation that we do track after that. So basically all the innovations in our portfolio are not just IDDS projects. A lot of them are. Forty-five percent of the innovations in our portfolio have originated from IDDS, but a lot of them came through separate microgrant processes or classes that we support, or research that we support, or came out of Innovation Centers that we support and are not necessarily born out of the summits. — IDIN Staff (S11)

Tracking Community Engagement

IDIN is also tracking the level and duration of engagement with the partner communities hosting IDDS projects:

The outcome is how many communities continue to engage in these projects. We do track that and measure that to see at what level the communities stay engaged later on. The immediate outputs: we work with four communities, and during the duration of the summit we engage x amount of people. The outcome is how many people six months later, two years later, fives years later, are still engaged. — IDIN Staff (S11)

Community engagement does not necessarily mean that these projects have achieved the intended impact or that the projects will be scalable. However, tracking the level and duration of community engagement provides proxy indicators for the level of interest and commitment of community partners towards IDDS projects. Although IDIN tracks engagement of IDDS participants, students from partner universities, and community members, IDIN especially values community partners engagement because they are the ultimate users of the technology (IDIN Staff, S11):

The avocado [press] that I referred to before, that project, the team is still working on it. [An IDDS participant] still lives in Arusha now. He moved there. He is still working on it. There are three members of the community who are very actively working on it. There are other members of the community who are less actively working on it, but are participating in it. They were not IDDS participants, but they are all in

working on it. And there is a class from D-lab working on it, as well. They are working on the solar dryer component of it and the market analysis component of it. And they are traveling over IAP [MIT's one-month Independent Activities Period between the Fall and Spring semesters] to help with it. So this is a project that has early signs of success because of the engagement at all of the different levels. They applied for a grant and we gave them a grant, as well. But the real success factor is the enthusiasm and the engagement especially when you have community engaged as they are the ultimate users. — IDIN Staff (S11)

Tracking participants, projects and community engagement provides IDDS with multiple views of their effectiveness. The data they have collected allows them to understand how well their strategy is working and how they might change it in the future. In particular, it allows them to understand how well they are doing at "creative capacity building."

5.4 IDDS's Strategy for Creating and Empowering Social Innovators

"CCB [Creative Capacity Building] postulates that technology creation can be one pathway for an individual to identify or affirm their own abilities, to invite communities to seek solutions together, and to build towards meaningful influence over their lives and livelihoods" (Taha, 2011, p. 13). In other words, IDDS believes that exposure to the design process as a structured way of framing a problem, generating innovative concepts, and refining and implementing a solution may empower development practitioners and low-income communities by encouraging people to try new ideas, experiment iteratively, and effect change.

In this chapter, I describe IDDS's strategy for creating and empowering social innovators (see my visual representation in Figure 5.2), based on an interview with an IDDS faculty member. The three essential components (the curriculum, the IDDS culture, and the participant experience) are the means through which IDDS helps participants to embark upon or move further along IDDS's Social Innovators' Pathway (see Section 5.3). If any of the three components are changed or removed, the resulting event may still be valuable, but it would not be IDDS (S2):

As people who create the event, run the event, then try to propagate what we believe it is, and what the values are about it, how we think about it to other people. You can take some of those essential pieces out and you will probably have a very interesting valuable event but it would not be our event. And you could also do that, and it would not be a bad thing. — IDDS Faculty (S2)

IDDS's curriculum consists of the lectures, hands-on activities, and team exercises that are used to teach the skills that IDDS believes are needed to practice IDDS's particular approach to HCD for Social Impact. The IDDS culture refers to the values, beliefs, and mindsets that IDDS is intending to impart to participants. IDDS's participant experience is intended to be a rite of passage into a Social Innovators' Tribe, and is meant to serve as a transformative design experience that increases participants' design self-efficacy.

Figure 5.2. IDDS's strategy for creating and empowering social innovators consists of the curriculum (IDDS, 2015a), the IDDS culture (IDDS, 2015b), and the participant experience (S2)

The following sections will briefly cover IDDS's curriculum and culture. IDDS's participant experience will be described in more depth and detail as this is the most complex and important of the three components of IDDS.

5.4.1 IDDS's Curriculum

Although the curriculum is perhaps the least important component of IDDS's strategy for creating or empowering social innovators, the curriculum is a concrete tool that IDDS organizers can use to plan and realize an IDDS conference:

> When [IDDS participants are] asked, "What is the piece of the experience they value the most?" It turns out to be the team experience, the people, and the exposure to different kinds of people, more than the lessons and the design, per se. — IDIN Staff (S11)

> There are creative people in our [IDIN] Network who join and organize [an IDDS]. And we don't think that we are fixed and rigid or that we have learned everything that there is to know about doing this. Beyond that, a good number of the logistics and the specifics of the programming do not matter a lot. I say that carefully because I believe a lot in human-centered design and a lot in the entrepreneurial approach, and a lot in technique (whatever tradition you want to cite for technique, whether you track back down to anthropology or other methods or community development principles, or community engagement principles). There are a lot of important principles involved. But it is not so critical which particular set is involved. […] But that doesn't do any good to the [IDDS organizer] who is actually going to do it. Because the most concrete tangible thing they are going to hold onto is the particulars of what we are going to do. — IDDS Faculty (S2)

IDDS's curriculum is guided by IDDS's theory of change about development. IDDS believes that by teaching people about design and entrepreneurship, they will be able to create technologies for social benefit. IDDS teaches people to co-create with users because IDDS believes that engaging in the process of innovation is impactful. In other words, IDDS's curriculum teaches the particular skills of IDDS's community of practice. A different theory of change would entail a different curriculum that would stimulate a different transformation:

> You can take another theory of change set with a transformative experience, and you will have something important. It will be like a parallel universe of IDDS, a lot similar, but basically different. We are partly imparting skills like that of design practice and entrepreneurship to people because those are part of our theory of change. But you can imagine all sorts of interesting things that impart a different practice, but also transforms them to become a part of that practice. — IDDS Faculty (S2)

Overview of the IDDS Curriculum

IDDS's curriculum (see Table 5.1) exposes participants to the design process in several different formats. There are lectures, demonstrations, and participatory exercises that aim to engage visual learners through reading and observing; audial learners through by listening; and hands-on learners by making, doing, and practicing (Smith, 2015g, p. 12). The main pedagogical approach of IDDS is project-based experiential learning in teams. "The [IDDS] curriculum is intentionally focused on projects, intentionally focused on learning by doing, and physical examples. It focused on teams (people working together)" (Former IDDS Organizer, S3).

Table 5.1. Core components of IDDS's curriculum (excerpts from IDDS, 2015a)

Orientation	IDDS History and Philosophy What is IDIN? Cultural Orientation Introduction to Communities and Projects IDDS Design Process
Framing the Problem	Stakeholder Analysis Gathering Information Synthesizing Information Problem Framing
Creating a Solution	Gathering Information Design Requirements Value Chains Idea Generation Analysis and Experimentation Concept Evaluation Detail Design and Fabrication Testing and Evaluation
Developing a Prototype	Getting User Feedback Design for [x] (e.g., Manufacturability, Affordability, etc.) Detailed Design and Fabrication
Introducing the Network	Staying Connected with IDIN and each other IDIN Opportunities for Alumni Planning for Project Continuity
Developing a Business/Venture	Business Models and Funding Manufacturing Supply Chains

IDDS's Teaching Principles

In addition to the curriculum, IDDS has also developed teaching principles to guide new IDDS instructors and organizers. IDDS recognizes that teaching adults is different from teaching children. IDDS's teaching principles are geared towards teaching a diverse group of adults:

> Adults bring a wealth of knowledge and experience that they want to share. Adults are decision-makers in their daily lives and they often prefer to direct their own learning. Adults are motivated to learn things that are applicable to their work or daily lives. […] Adults are busy and expect their time to be well spent

during a training. — (Smith, 2015g, p. 20)

Teaching design also has some distinguishing qualities. Design is open-ended with no single right answer. Furthermore, the design process is repeatable but may yield different solutions during different iterations. The teacher is not the expert, and solutions are generated by the participants. The creativity and knowledge of the learners is what is most important (Smith, 2015g, p. 21). Being a design facilitator for IDDS teams is difficult because it is challenging to determine how much guidance to provide and how much to let design teams explore and learn themselves.

Changes in IDDS's Curriculum

Since the IDDS curriculum was designed for a group of learners from all walks of life, it is broadly applicable. In theory, it could be transferred with minimal adaptations to various different settings:

> The IDDS curriculum is broad and could be static. […] The audience has been a broad range of people with a variety of educational levels and rooting in different kinds of context. The examples can be understood as just as examples that are pointing to a philosophical or abstract idea. — Former IDDS Organizer (S3)

However, the IDDS curriculum is continually evolving because "all the people who are involved [in IDDS] are never going to be satisfied in one particular way" and are always going to experiment and try to improve (S3).

Table 5.2. Themes of IDDS conferences from 2007 to 2012, adapted from (Smith, 2015h, p. 13)

YEAR	HOST UNIVERSITY	COUNTRY	THEMES
2007	Massachusetts Institute of Technology (MIT)	United States	Prototypes, Not Papers
2008	Massachusetts Institute of Technology (MIT)	United States	Developing Technologies and Technologists
2009	Kwame Nkrumah University of Science and Technology (KNUST)	Ghana	Collaborative Co-Creation
2010	Colorado State University (CSU)	United States	Prototypes to Products. Projects to Ventures
2011	Kwame Nkrumah University of Science and Technology (KNUST)	Ghana	Integrated Innovation
2012	University of Sao Paolo (USP)	Brazil	Going Local

IDDS revises its curriculum every year (see Table 5.2 for a summary of conference themes). In 2007 and 2008, IDDS brought community members and students to MIT, where they could co-create technologies with rapid-prototyping facilities and cutting-edge machine shops. The theme for IDDS 2007 was "prototypes, not papers," emphasizing the action-oriented goal of IDDS to have a tangible social impact. In 2008, the theme was "developing technologies and technologist," noting the shift towards inspiring and empowering social innovators in addition to creating technologies.

In 2009, IDDS moved to Ghana where design teams could more easily engage and collaborate with partner communities and local artisans throughout the design process. To support the theme of "collaborative co-creation," IDDS added lectures on Ghanaian culture and

user research to prepare design teams to conduct interviews and observations with users in partner villages. IDDS also developed hands-on "Build-It modules," in which IDDS participants learned prototyping skills by making various technologies. For example, participants learned about basic electronics and hand tools by making a solar lantern.

From 2007 to 2009, IDDS mainly focused on the technology design, and did not emphasize market research, business plans, or scalability. In 2010, IDDS shifted focus from creating early stage technologies to advancing "prototypes to products," and "projects to ventures." New lectures were developed to teach business plan design, manufacturing at different scales, and supply chain management. "IDDS 2011 [in Ghana] was the culmination of all the summits before it, and the beginning of a more integrated program consisting of village-based market research, market experiments, iterative design, field testing, user feedback, and co-creation" (IDIN, 2015c). All subsequent IDDS conferences have followed this "integrated innovation" theme by including both a design and entrepreneurship components into their curriculum.

In 2012, IDDS was held in Brazil where the theme was "going local." IDDS 2012 represented several shifts in IDDS's organizing strategy. Prior to 2012, all IDDS conferences were led by IDDS's core faculty and organizing committee at MIT. IDDS 2012 was the first conference led by a local organizing committee at the host university. Supporting local organizing committees is aligned with IDDS's core value of capacity building. Moreover, it enables IDDS to offer multiple conferences per year, thereby scaling up its program and reaching more people:

> We have chosen to run regional summits and multiple summits and to support organizing teams to apply, step up, to take the opportunity to run a summit. And give them a chance to do something they want to do, and to meet their needs, and give them an opportunity to participate, but in part, to run the organization. So instead of us just running one summit every year, same size, same people running it. We could do that. We are not doing that. We are looking to scale. And part of scaling is to have each event produce more than one new event. — IDDS Faculty (S2)

IDDS 2012 also represented a shift towards supporting regional conferences in which the projects are focused on meeting local needs. The regional focus also typically means that a greater proportion of participants are from the country hosting the event. In theory, if more IDDS participants are co-located, it may be easier to continue project development after the conference ends.

In 2013, IDDS received funding from USAID and began to more heavily emphasize scalability to align with the priorities of their funders. IDDS is experimenting with changes in their program design and providing follow-up to better support the scalability of products developed by IDDS participants. IDDS staff have been weaving in discussions about project continuity and scalability throughout the IDDS conferences:

> Those are the things that are the job of the instructors and organizers (to clarify what timeframe you want to have impact over). Also design facilitators can reinforce that and get people to actively start something that down the road will have impact. Ask them periodically throughout the summit, what needs to happen to get this to work. And can we, during the summit, put mechanisms in place that will help the continuity to happen. We are rarely completely finished at the end of the summit. — Amy Smith, Director of IDDS (Smith, 2015d)

In addition to changing its curriculum, IDDS has also been experimenting with shorter one- or two-week themed conferences, rather than the original five-week conferences that address

multiple sectors. "Two-week summits delve into a specific topic such as urban waste systems and develop innovative ideas and proposals, while month-long summits address broad topics like agriculture, health, and education and result in viable prototypes" (IDIN, 2015f). These shorter conferences focus on a portion of the design process. For example, they might focus on identifying a problem and problem framing, but may not develop prototypes. Alternatively, shorter conferences may start with a narrowly scoped, well-defined problem framing, and focus on concept generation and prototyping. Shorter conferences enable people who otherwise would not be able to attend a five-week conference to have an IDDS experience.

Experimentation has enabled IDDS to adapt to new contexts and explore new models. However, experimentation can present some difficulties in disseminating the curriculum:

> In general, often our strengths are also our weaknesses. […] It is a strength to be creative, to be driven, to find the next thing, to be creative and optimistic. All of those are strengths. At the same time it makes it difficult for the methodology to spread and for local organizing teams to really embody the curriculum so that they can teach it and deliver it themselves, to have opportunities in advance to teach that curriculum so that the summit is not the first time that they try to teach the curriculum. — Former IDDS Organizer (S3)

In 2015, IDIN developed an IDDS Prep Book (IDDS, 2015a) and Design Facilitator Training materials (IDIN, 2015b) that provides new IDDS instructors and organizers with the core IDDS curriculum. Local organizing committees then have the autonomy to modify the curriculum and integrate new material.

To illustrate how local organizing committees have exercised their autonomy to develop variations of the IDDS model, we can observe vast differences in the three IDDS conferences sponsored by IDDS in 2015:

- An eleven-day conference was held in Botswana to teach IDDS's design and entrepreneurship curriculum to the San people so that they can use their indigenous skills in arts, crafts, and music to be financially self-sustaining (McKown, 2015e). This was the first IDDS focusing on capacity building for a particular community.
- A four-week conference was held in India to develop prototypes that would improve maternal and infant health, family health, and sanitation and hygiene. This is the first IDDS that was held where an IDIN had established an Innovation Center to provide resources and training for the development of technologies for poverty alleviation. The Innovation Center is intended to support the continuation of IDDS projects, as well as support community members in developing new projects.
- A two-week conference was held in Colombia to explore solutions around the theme of Zero Waste. IDDS Zero Waste is the first IDDS with significant collaboration with government entities and policy implications.

Thus, IDDS has continued to iterate around both the topics as well as the means of delivery of its conferences as it has learned what works best towards achieving its goals.

5.4.2 IDDS's Culture

Another core component of IDDS is its culture or value system (S2). An IDDS faculty member elaborates upon what some of IDDS's values entail:

> It matters that people come with similar values. They come with a commonality around poverty and development and addressing well-being for people who are under-served. — IDDS Faculty (S2)

> We talk about mindset. It is not easy to be human-centered or be engaged in co-design, to be open-minded or to be engaged in diversity, or to put other things first than yourself – all sorts of things that are a part of this mentality. — IDDS Faculty (S2)

IDDS organizers and participants refer to their shared values as the "IDDS Spirit." The IDDS logo is an Adinkra symbol (see Figure 5.3), which represents a Ghanaian proverb "Boa me na me mmoa wo," which means "help me and I will help you" (IDDS, 2015c). This symbol and motto are the core of the IDDS Spirit (IDDS, 2015c). People with the IDDS Spirit are hands-on, and learn experientially (IDDS, 2015c). They are open "to new ideas and new ways of thinking and actively seek to be a part of communities where diversity of thought, background, gender, age, religion, and nationality are celebrated and brought together" (IDDS, 2015c). They believe that everyone can create and that people must co-create with communities to achieve impact (IDDS, 2015c). They are resourceful, and see the potential in everything and everyone to contribute towards a solution (IDDS, 2015c). Finally, as stated by IDDS:

> We value what other people think and how they feel. We are comfortable living in rough conditions that most of the world's population live in—perhaps with irregular access to water and electricity, and where relationships are valued more than time. We each have something to teach and we each have something to learn. — (IDDS, 2015c)

Figure 5.3. IDDS's logo (IDIN, 2015f)

Much of the IDDS Spirit is conveyed to participants by instructors and organizers by how they treat participants and how they make decisions when organizing the conference:

> It is not just the curriculum that matters, but what happens outside of the curriculum. As organizers and instructors, things like participant presentations are really important because they allow people to share information about their culture and their work back home. Activities that engage everyone together in a way that it breaks down economic, language and a variety of barriers are really important. So we try to keep this collaborative and cooperative spirit going. It has to be pervasive in everything that we do.
>
> One of the things I like to think about is that there are some people who attend IDDS who have less access to the internet and social media. While we are doing the planning for the summit, we make sure that we are not excluding people based on their connectivity. Because if they show up at the summit and they are the only ones who do not know anyone else, then that put them in a disadvantage. That somewhat marginalizes them beforehand.
>
> So we try to strive for equity within and throughout the participants. We ask ourselves what are we doing with the planning and is it equally accessible to everyone else. If there is someone who has a hard time getting access to the internet, I would ask all instructors and facilitators to be intentional and think about what that means for their experience and does it differentiate them from others. — Amy Smith, Director of IDDS (Smith, 2015a)

In short, IDDS fosters a culture of openness, sharing and of helping one another, which is critical to expanding its reach and ensuring ongoing application of the learning of the IDDS conferences.

5.4.3 IDDS's Participant Experience

The IDDS culture plays itself out through the participant experience. The participant experience during IDDS conferences consists of two main components: 1) a rite of passage into a social innovators' tribe, and 2) a transformative design experience (see Figure 5.4). The following sections will describe in further detail the essential attributes of creating a rite of passage, and a transformative design experience.
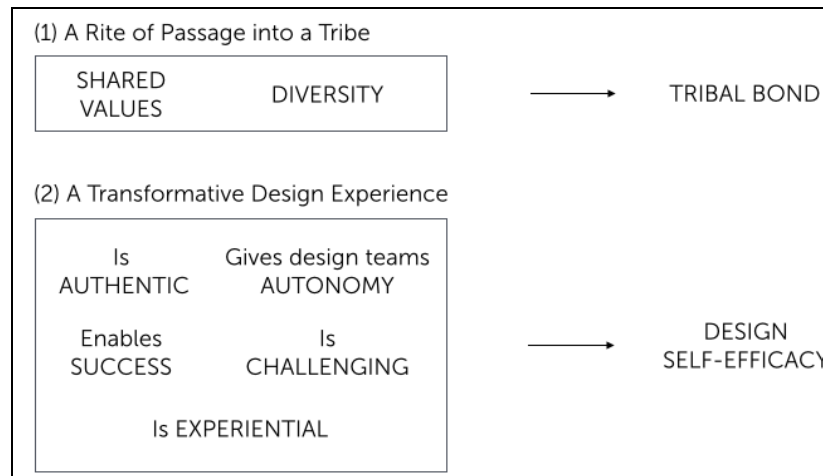

Figure 5.4. My visualization of IDDS's participant experience

A Rite of Passage into a Social Innovators' Tribe

People come to IDDS for many reasons. Some want to learn or practice HCD for Social Impact. Some already have design experience and want to gather ideas for teaching. Some participants do not know what to expect, but trust others who saw their potential and invited them. Coming from all over the world, from different paths of life, these participants share a common desire to create opportunities for people to live healthier, safer or more fulfilled lives. IDDS offers a nurturing environment to consider one's purpose in the world and bond with like-minded individuals. This process of self-reflection and integration into a community with a shared purpose is a rite of passage into IDDS's Social Innovator's Tribe:

> You start creating a community of practice here [at IDDS] in a very concentrated way. People get in a community of practice. (There is a lot of community of practice research and literature.) People get from the peripheries of a community of practice to the heart of it, maybe often through a long process over time. This is in a way, an attempt to get people to move towards the heart of the community of practice quickly. Partly from the transformation and partly from the practices themselves that identify them with that tribe. — IDDS Faculty (S2)

Members of the tribe have all gone through a similar set of experiences at IDDS conferences. In addition to facilitating a shared design experience, IDDS organizes community-building activities, such as a talent show, international potluck, and opportunities for participants to give presentations about themselves and their lives. Moreover, IDDS organizers also catalyze a familial or tribal bond among participants by modeling and encouraging communal, inclusive, and collaborative behavior. An IDIN staff member summarizes how the "shared design experience" incorporates more than just the design training curriculum (S11):

> One of [the outputs of IDDS] is a group of people who have had a shared design experience. And I used the word experience more broadly because that experience has a lot of pieces in it. It is not just training, per se. Training is part of it. Training on what the design cycle is, training on participatory designing and co-creating in particular, and training on using particular tools, for example.
>
> But it is the whole experience. It is the experience in the community. It is the experience working on very diverse teams. That whole thing together is what was provided to those alumni and those alumni come out of it with that shared experience and that new orientation of looking at the world. So it is not the knowledge and training; it is perspective. — IDIN Staff (S11)

For many, IDDS is an experience with many firsts; it may be their first time out of their hometown, away from their families, or engaging with people across a range of socioeconomic and cultural backgrounds. Immersion in diversity and unfamiliar environments causes people to question assumptions and their position in relation to others and their world. An IDDS faculty member describe IDDS as a "mind-blowing event" that transforms participants (S2):

> I think of IDDS as a mind-blowing event. The way I think about it, the way I describe it is to get people in a crucible. It is a long event. It is intense. It is hands-on. It gets challenging. People to do things they haven't done before to work with other people they haven't worked before with, or work across culture. It is hard. It is challenging. It takes courage. The summits are point events. They are five weeks long, which is a long time, but still they're one-off events (each summit). The goal for the summit is much more in changing how people think about themselves, and what their options are and their choices are in the world, or what they should maybe be doing. It's about their belief about themselves, maybe their self-efficacy, about their identity, and their possibilities. A lot of people go to summits and don't think that they can go things that they leave the summit thinking they can now do. — IDDS Faculty (S2)

IDDS is an intense, concentrated period of time that causes people to reflect about what they want to do with their life. Living intimately with other like-minded individuals who want to contribute to society makes you realize that you are part of a tribe (S3):

> When you bring people together, in a very intense and concentrated period of time, give them a problem to work on, challenge them to solve a problem, have the people live together, eat together, share parts of their culture, […] and pause for a minute from the daily grind of life, I think it is inevitable for people to start reflecting on what is meaningful and what is not meaningful, as far as work. I think people inevitably start to reflect on what they want to use their time on the planet for. And whether they want to use their skills and abilities to focus on self-preservation and of the immediate family, or whether they want to use their talents, skills, abilities, time, etc. to do that, plus thinking about contributing to their community or beyond. A lot of the people who apply to IDDS are already thinking about those things clearly, that's why they get selected. But I think a concentrated period like that starts to crystallize things in people's minds. You start to see other people like yourself. You start seeing that you are a part of a tribe of people who view the world that way, who view their time on the planet that way. I think it has a lot of impact. — Former IDDS Organizer (S3)

Some transformation occurs when IDDS participants engage with people in community and people living in poverty, and form bonds across geographic and cultural barriers:

> Some of it [personal transformation] comes strongly from people who engage in the summits, who are affected often deeply by their interaction with both people in community and in poverty, but they are not the same thing. It's one thing to experience people in community and to experience the richness and the value and the truth of their lives, but that overlaps the truth of poverty and the situation they are in. I think that the people in the summit genuinely make friendships and relationships with people in the communities. […] There are layers in that complexity, but people are affected by that engagement a lot. — IDDS Faculty (S2)

> By the end of the event, people are very emotionally engaged with what they are doing and the people they spend time with. I am not the only one, but there a lot of people crying at the end of the event. And, it is really hard to stop after what you have been doing together, and after investing in, being open to all these things, and changing, and caring a lot about stuff. — IDDS Faculty (S2)

In order for people to form bonds, they must share similar values. For IDDS, the commonality among participants is a dedication to "addressing well-being for people who are under-served" (S2). This commonality creates a bond that surpasses differences in language, culture, and disciplinary fields. Moreover, the ability to bond with such as diverse group of people united under one cause creates a sense of being part of a global movement:

> It matters that people come with similar values. They came with a commonality around poverty and development and addressing well-being for people who are under-served. So that is important. The diversity is important. It matters that they meet people from all over the world from all kinds of cultures that feel the way they do and care about something they care about, but are not like them. They do not come and meet other people like themselves. It is not an event with themselves. It is an event with totally different people. — IDDS Faculty (S2)

Having shared values balances the potential disharmony created by diversity:

> Too much diversity is challenging. For example, if we did not have common values and we are from different cultures and have a lot of other diversity, we find that we lose the common ground to get together. And we could storm with each other and not be able to relate with one another. We need built-in ways to relate with one another. A common purpose helps us do that. Too much diversity will be difficult. We can see that literally in, not only in people's culture difference. When they do not speak the same languages, and so now we are translating across… one way logistical and one way deeply cultural. "I speak a different language therefore I understand things differently. I do not have words for some of the things you are saying. How can I understand it?" — IDDS Faculty (S2)

In order for these transformations to occur, it is important to create time for IDDS participants to reflect upon why they are doing the work they do (S3):

> What I mentioned before about people's motivation or people doing this for wrong reason or the right reason: I think one of the key values that needs to be embedded in all of this work is self-interrogation and reflection. And what I mean is I think we all have to ask ourselves questions about what we want out of life, what is enough for us, what products we are going to use, where we want to live, how we want to live. All of those personal questions tie deeply into the work we want to do. I am not interested in specific outcomes, more so that there is a process embedded in how we work that really challenges people to do that work with themselves. Individual work, which is not stuff that you do in a group, is not stuff that you do with a team. You may have a conversation because it is interesting, but it is more about how your own understanding of yourself has led you to the work that you are doing. […]
> It is more about challenging people to be clear with themselves as to why they are where they are. That process of reflection leads to all kinds of reflection that helps the work along - how you communicate with people, the interactions, power dynamics - all those other things I mentioned; it all ties back to reflection. — Former IDDS Organizer (S3)

Reflection is also important for sustaining a commitment to working in social impact (S3):

> What I am saying is that a process of reflection makes the choice of continuing this work more intentional. Intention is connected to inspiration. It is connected to the passion that sustains you. It is connected to the drive that pushes entrepreneurs and all the other things that we talk about. The beginning of all of the process is intention. In order to fortify anybody's understanding of their own intention, whatever they may be, the process of reflection is important to have in these kinds of methodologies. […]

> It does not have to be some forced heavy thing. But I think it is really important. […] I think it is really important for the longevity. I feel that flash-in-the-pan inspiration is short-term and short-sighted. It is the shininess of new, and it is not necessarily going to lead to the other things that we say are important when we talk about teams that succeed. When we talk about teams that succeed, we talk about a person or a group or people who are driven, who have this internal motor to succeed and that's what allows them to persevere through all of the challenges. I think that in and of itself speaks to something beyond, "Hey, it's shiny and new," and "It's great, and it is wonderful for the community." — Former IDDS Organizer (S3)

The tribe is important for the sustainability of IDDS. Since current members of the tribe believe in the values of the tribe, they invite others into the tribe:

> It's important to have the tribe because to a certain extent, tribes are self-propagating. Tribes have a belief so they are acting on those beliefs until they change. They think that it is the right thing to do in the world, and they think that they are doing good. I think we clearly think that we are doing an activity that is rooted in some form of human values or human rights or some form of development that is honest or true. And so it is acceptable to invite other people to this tribe. — IDDS Faculty (S2)

It is assumed that those who participated in IDDS adopted the values of the tribe and can be trusted by others in IDDS to "do the right thing," including organizing an IDDS conference:

> One of the things we do almost religiously is that if you are going to do anything on behalf of IDDS, you have to have had the experience. We constantly say to people, if you want to start a summit, you should have been a participant in the summit. You should have this experience. […] To have that kind of foundation, we trust people a lot that you have done that all the way through. And you self-identify that you want to continue this. You are not one of those who had this experience and then walked away. But you have self-identified that you want to do something. There is something special going on there, and you can be trusted at some pretty significant level to do the right thing or to do something appropriate. — IDDS Faculty (S2)

In effect, the tribe provides the human resources to continue organizing IDDS conferences or summits, which will indoctrinate more people into the tribe:

> There is an instrumental quality, which is in order to sustain an activity you need new people to do it. It's also instrumental in the sense that it's a fundamental model of replication and scaling because an event creates a group of people that have been changed. And some of them can organize, they will divide, they will catalyze new groups who can organize something and run an event that will cause people to change and who will divide. It's an approach that can grow and grow large and that's intentional. — IDDS Faculty (S2)

A Transformative Design Experience

IDDS is a transformative design experience. The entire cohort of IDDS participants is guided through the design process together. Throughout their design experience, design teams commiserate over tribulations and celebrate each others' triumphs. These shared experiences stimulate feelings of camaraderie.
IDDS faculty believe that personal experience is paramount in changing beliefs and behavior:

> I think that people's identity itself is shaped by their experience, so the fact that they have the experience, they become a different person. They've committed to this [IDDS] event. They've come, and they've done it, and they can't really leave. It might not come and express in their day. They might leave the summit and go back to being the person they were. But there is this reality that this experience is going to change you. Some people are going to change a little, and some are going to change a lot.

> I am not much of a believer that people can conceptually, rhetorically or argumentatively just change their identity. "I will simply change what I believe and then I will behave differently" — that one can rationally play out such a scenario. Maybe really people's beliefs change based on the experiences they have. What we are after is changing people's beliefs so experience matters. You can't just talk to these people; we have to give them an experience. — IDDS faculty member (S2)

IDDS faculty believes that transformative design experiences must be authentic, enable success (while being challenging), and provide autonomy:

> These three things are what I keep in mind when I do projects and design work with people and create experiences with people: That they have to be authentic. They need to be successful; they have to able to achieve something and feel like they made progress and got somewhere. And they have to feel like it was under their control. We cannot do it for them. […] Then, the crucible part… the hands-on experience. They are really working on a project of some kind. They are grappling with a challenge. It is hard. — IDDS Faculty (S2)

> Community engagement is really important. But you can argue that that itself is not a criteria for a successful event. Because being authentic is essential for a successful event, and engaging communities is authentic. So coming and trying to come up with approaches to challenges and not engaging stakeholders... In our value system, not having community members would not be authentic. — IDDS Faculty (S2)

> It is pretty critical that people are successful at something they engaged in and experienced. They feel like they did it. They accomplish something. So we are giving them a chance to do something challenging and something especially people didn't believe they could do before, or maybe they could believe they could do before they went in or had a doubt. — IDDS Faculty (S2)

Other forms of training may be considered "experiential and authentic," but it is not necessarily "transformative" (S2). IDDS Faculty elaborates upon the importance of experiences in stimulating transformations:

> There is a fair bit of evidence that suggests that training is not necessarily transformative. At some point, maybe you make the training sufficiently experiential that it is transformative. But it is in itself not transformative. You can spend a lot of time giving people training, but they will not change what they do in their lives. — IDDS Faculty (S2)

The design projects create the potential to produce beneficial products, and enables IDDS to authentically engage with communities:

> The projects are the vehicle that leads to some near-term, maybe immediate potential inventions or designs or prototypes or products […]. If you took them out, you wouldn't have an authentic hands-on experience. You'd be back to talking or something else. You couldn't engage communities in an ethical or responsible or authentic way. […] I would not want to engage communities without there being a legitimate basis to do that, where they benefit and are valued and respected and supported and are stakeholders with their own set of opportunities from this experience. We need communities in order to have projects so that we can have these people having experiences. We don't otherwise need these projects or communities. You get in an exploitive space.— IDDS Faculty (S2)

According to an IDDS faculty member, "there is a lot of natural tension between [criteria for a transformative design experience], and that it is probably an essential tension. You don't resolve it, but you balance them" (S2).

For IDDS, in order for projects to be authentic, design teams must engage community members in designing solutions to real and meaningful problems. Design projects cannot be trivial or only for learning purposes. Design teams must also have autonomy in directing the

project. Teams must grapple with real world complexities and constraints. In addition, the design project must be challenging to stimulate growth and learning for the design team, and it must also enable success. In the context of IDDS, projects must be challenging, and teams must be able to successfully produce prototypes.

The framework of self-efficacy may be used to explain the mechanisms causing the personal transformations that occur at IDDS. The concept of self-efficacy refers to "people's belief in their capabilities to mobilize the motivation, cognitive resources, and courses of action needed to exercise control over events in their lives" (Wood & Bandura, 1989, p. 364). There are four main mechanisms for increasing self-efficacy:

1. Enactive mastery experiences: transformational life experience attesting to the capacity for personal change (Bandura, 1994)
2. Social models: when people like you succeed, your self-efficacy increases through vicarious experience (Bandura, 1994)
3. Social persuasions: people tell you that you have the capabilities to succeed in given activities. This effect is stronger if you have strong emotional bonds to your persuader (Bandura, 2006)
4. Physiological and affective states: inferences from somatic and emotional states indicative of personal strengths and vulnerabilities

IDDS increases design self-efficacy via these four mechanisms (see Table 5.3). IDDS participants experience enactive mastery experiences through their IDDS projects. Lectures introduce theory and methods that participants can apply in practice to advance their design projects. During Build-It modules, participants learn to use basic hand tools or power tools, and practice these skills by making simple technologies, such as a solar lantern, hacksaw, or water pump. Design facilitators and workshop technicians provide assistance to help teams navigate the design process and produce prototypes. For many IDDS participants, IDDS is their first experience with designing and prototyping a technology.

Table 5.3. IDDS's mechanisms for increasing design self-efficacy

Mechanisms for increasing self-efficacy	IDDS mechanisms for increasing design self-efficacy
Enactive mastery experience	• Providing "Built It" training lessons to teach prototyping skills, and assigning design facilitators to mentor teams support teams' success in prototyping. • Going through the entire design process for a real project builds confidence.
Social models	• Design facilitators are often former participants who can share personal stories about how IDDS has helped them learn to design. • Guest lectures from successful inventors and entrepreneurs inspire participants to believe that they can also create technologies and ventures.
Social persuasions	• IDDS believes that "*anyone* can become a creator of technology." • IDDS instructors and organizers believe in all the participants and challenge them to grow.
Physiological and affective states	• IDDS strives to maintain a supportive, familial environment that is high-energy and fun, rather than stressful. • IDDS tries to manage participants' frustration and disappointment by helping them understand that development work and invention are hard, and that prototypes typically do not work the first time.

IDDS participants are introduced to "social models" by various means. During IDDS, participants volunteer to deliver presentations about their involvement in development work as well as personal interests and passions. These participant presentations help IDDS participants get to know one another as people and to also be inspired by the work others like themselves are doing. IDDS alumni also return as IDDS organizers or design facilitators, and participants can learn about what they have achieved since participating in IDDS. IDDS hosts successful development practitioners as guest speakers and design facilitators:

> It is also a feature of the IDDS curriculum that a lot of the people who are working on their projects are exposed to existing technologies and existing stories of people who are creating things and other models. — Former IDDS Organizer (S3)

For example, Paul Polak, the founder of an organization that developed and disseminated over a million treadle pumps that helped lift small farmers out of poverty, has spoken at several IDDS conferences and mentored IDDS teams.

The social persuasion mechanism is enacted through the core leadership of IDDS. According to an IDIN staff member, "people get inspired in a certain way, and I think that might have something to do with the core leadership of IDDS" (S1). IDDS's core faculty members shaped IDDS's philosophy. IDDS is based upon the premise that anyone can become an active creator of technology, not just a recipient or user of technology (Taha 2011, p. 3).

Physiological and affective states, such as feelings of stress or anxiety, are natural for time-constrained high-pressure environments. It is also important to acknowledge that development work is challenging, and that not continuing the project does not indicate personal weaknesses or failures:

> When I mean "tell the truth," I mean "inspire people," but at the same time, let them know that this is a hard road and that staying engaged and connected, and project continuity — all of these things are very challenging. Working across a broad network is very challenging. And [let them know] that we have to figure all these things out together. I think it is critical to be honest and upfront about those things. — Former IDDS Organizer (S3)

The participant experience thus leverages the strong culture of IDDS, bringing participants into the tribe and providing them with a sense of possibility, a belief that they, too, can succeed. Although the IDDS conferences appear to be effective in inspiring people to dedicate themselves to social innovation, additional resources and programs are required to provide the support needed to develop scalable products. The collection of resources and programs within which IDDS operates is IDIN's Social Innovation Ecosystem.

5.5 IDDS in the Context of a Social Innovation Ecosystem

When IDDS was launched in 2007, the program had dual goals of achieving impact through design education and design practice. There are challenges associated with trying to address a multifaceted mission of achieving impact through design education and design practice through a single program. Eventually, several new programs and resources were developed to better support each aspect of the mission (see Figure 5.5). In 2012, USAID awarded a five-year $20 million grant that funded the development of the International Development Innovation

Network (IDIN), and IDDS was integrated into IDIN's Social Innovation Ecosystem (see Figure 5.6) of programs, partnerships, and resources.
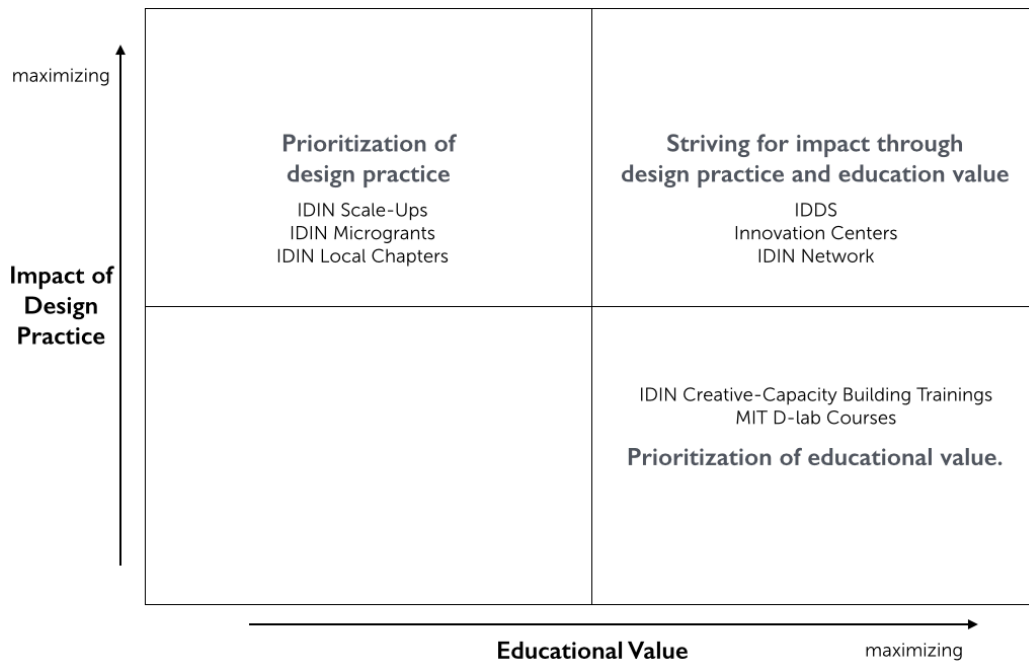

Figure 5.5. Evolution of IDDS from a program with dual goals to an ecosystem of supporting programs and resources
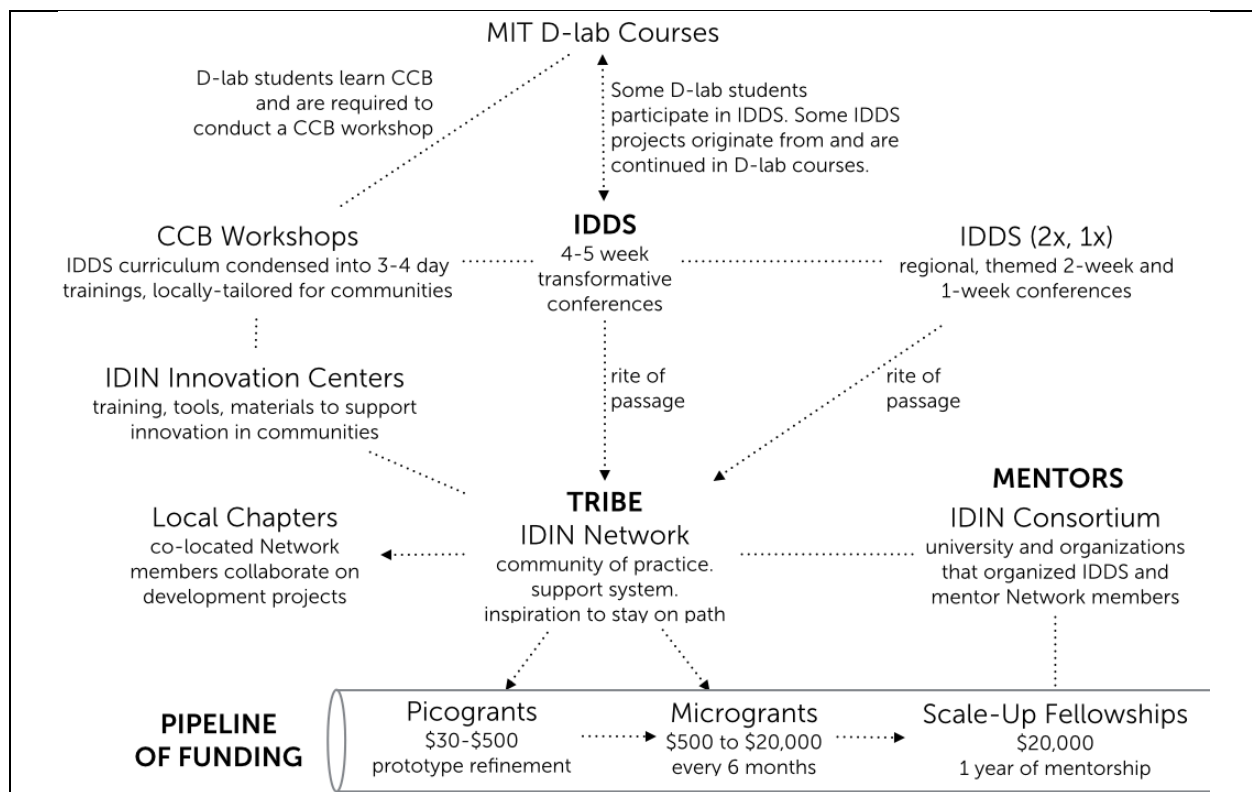

Figure 5.6. My visualization of IDDS's Social Innovation Ecosystem

Before the IDDS program was launched, MIT had been offering D-lab courses about design and development. With the integration of IDDS into IDIN's Ecosystem, more IDDS projects are being continued and further developed in D-lab courses. D-lab projects have occasionally been the source of some IDDS projects. In addition, some D-lab students have volunteered to organize an IDDS conference or participated in IDDS conferences.

The IDIN Network consists of former IDDS participants. IDIN's Network Coordinator is responsible for supporting the IDIN Network and has helped Network members stay connected and find resources. Two main areas of support are a pipeline of funding for projects (see Section 0), and referrals to mentors. The International Development Innovation Network (IDIN) Consortium is a group of universities and organizations that are collaborating on international development initiatives. IDIN Consortium members provide mentorship and educational or employment opportunities for IDIN Network members.

Creative Capacity Building (CCB) Trainings and Innovation Centers enable IDIN to build capacity in communities for local innovation more directly than the IDDS can. The intrinsically global and international nature of IDDS conferences requires them to be general and broadly applicable. CCB Trainings were developed based on IDDS's curriculum to be locally-tailored for each community, focusing on technologies and skills that are readily applicable to the learners. The CCB curriculum has distilled the core aspects of IDDS's curriculum into three- to four-day training sessions that can be delivered to audiences with no formal education and in villages "under a mango tree" (S3). CCB Trainings prepares community members to co-create with IDDS design teams:

> The CCB curriculum is a useful tool for IDDS organizers as they seek to engage a broad range of community members both during and after the summit so that projects are deeply informed by, and embedded in, local contexts. Wherever a summit is hosted, local community members are often invited to participate in 3-4 day CCB trainings in order to become familiar with the design process and, thereby, to be able to work more collaboratively with IDDS design teams. — (D-lab, 2015b)

Innovation Centers serve as an outreach center providing training in design to community members, a community space to share and test ideas for development solutions, a workshop space with tools for prototyping, and a marketplace for network members to showcase, buy, and sell development technologies (IDIN, 2015f). Innovation Centers are places where people can make things with a social impact intention:

> For me, a hackerspace tends to be something that is focused on IT [information technology]. It is very tech-based and could be used to make anything. It does not really have to have a social objective, a social impact objective. Same with a maker space: It is less about digital, less about IT, and it could be crafts, fine arts, engineering. It could be any kind of making, and it is an open space for people to share and make stuff with or without a social impact intention. Fablab is similar to makerspace, but it ups the game to digital fabrication equipment. Again, no intention for social impact is required. There are different kinds of FabLabs. Innovation Centers are maker spaces with a social impact intention. They may have some digital fabrication equipment, but they mostly do not. They are open to any kind of makers but the common thread is that people want to solve problems that are relevant to their communities. That is the difference. — IDIN Staff (S3)

An IDIN staff member elaborates upon how Innovation Centers can support IDDS:

> [Innovation Centers] are the centers where the IDDS curriculum and the CCB curriculum can peacefully coexist. Meaning, one idea for Innovation Centers that happen in countries and places where summits have happened is that it can be a site where project continuity from the [IDDS] summits can

continue. It is often the case that people who do IDDS want additional training, or they want to train other people in their area. They have heard of CCB, they might think they know what CCB might be, and they think that they can use that to train other people. Or there might be people who run the Innovation Centers and think that they can do shorter things, not a whole IDDS, but for ongoing training and for people who hear about our Innovation Centers and want to come. How do we get them familiar with our design process? A shorter 3-day or 4-day training is the mechanism for that.

Looking at the Innovation Centers we have at Uganda, [Tanzania, and Brazil], all of them [the people who manage these Innovation Centers] have done IDDS. All of them have had exposure to the CCB Curriculum. And, they are choosing how they want to train others in the design thinking curriculum whether it is elements of the IDDS curriculum or it is elements of the CCB curriculum, either way. So that's how they come together in this physical space of the Innovation Centers. — IDIN Staff (S3)

IDIN's Network Coordinator emphasizes the importance of providing holistic support, including funding, mentorship, capacity building, and more:

Our programming is also becoming more interconnected. We take a package approach to providing support. Funding alone and mentorship alone won't make a difference, but if you combine those, and give ongoing opportunities for capacity building, and pair up people with students, the chances of that project growing and moving to the next stage will be a lot higher. That's the hypothesis that we operate under right now. — Jona Repishti, IDIN's Network Coordinator, (as quoted in McKown, 2015a)

Through the interconnectedness and support mesh of the IDIN Social Innovation Ecosystem, IDIN hopes to address the challenges of project continuity after IDDS conferences:

Everybody will say that project continuity is hard and there is a gap there. With microgrants, with looking for synergies with D-lab classes, looking for synergies with Innovation Centers, looking for graduate students who want to go into the field, and trying to create a support mesh for the projects. That's how people are trying to address some of the continuity issues. Local chapters are another way people are looking at for continuity. Building stronger relationships with communities before, after, and during the summits so that communities are the agents for project continuity. — Former IDDS Organizer (S3)

In the following sections, I hope to capture some of the challenges encountered and lessons learned by IDDS. I will present in-depth perspectives from interviewees about the ways in which IDIN Social Innovation Ecosystem is supporting people and supporting projects. Although IDDS has learned significantly through experimentation, IDDS acknowledges it has not figured everything out and invites others to learn together:

Truth is key and being honest about what challenges lay ahead and what is really difficult about this work. […] There are many challenges and none of us know how to do this correctly, that we are all trying to find our way, and we are all trying to learn from one another. [IDDS's core leadership and everybody else] haven't figured this all out. Therefore, we should all be acolytes. This is about all of us trying to figure something out together. And then, everybody has something to achieve to that end. — Former IDDS Organizer (S3)

5.5.1 Supporting People

Since IDDS's theory of change hinges upon creating a global network of people that will produce innovations, it is critically important to support those people:

Basically, our theory is that via training these innovators and by connecting them to each other via the [IDIN] Network and continuing to provide them with resources, like workshops and money and continuous training and support…. Those are the ingredients so that they can continue innovating and that their innovations can continue to impact their communities more broadly. The ingredients are there. It is not just

training someone so they can go and do it. It is training them, providing them with the connections to other people who know things that they do not know and then providing them with extra resources to move things forward in the form of workshop space and funding. — IDIN Staff (S11)

My bias is to prioritize people and to work on inspiring people and supporting people — telling people the truth, struggling with people, engaging with people. Because people are going to drive the process, people are going to drive the ideas, and people are going to drive the products. You can have a perfectly good product, but if somebody loses faith, hope, or motivation, the product is not going to do good on its own. So I think that the appropriate balance is to really invest in the people in our network, and focus less on quantity and more on quality, quality engagement, quality support in particular. — Former IDDS Organizer (S3)

Supporting people begins at IDDS with a philosophical underpinning, which aims to help participants and community members be more autonomous, advance their opportunities, and enable them to be the best they can be (S3):

The values that I think are important have to reflect a desire for people to ultimately be autonomous. To me, it is similar to loving a person enough to let them go, if that's what they want to do. For me, that means really truly believing that our aim is to hand people a process that they can use for their own ideas and their own concept of what development is. And that we truly are interested in doing nothing more than supporting people in that endeavor. That we want people to have the space and time to figure out that if this is their tribe, if this is the work they want to do, if they want their professional concern to be creating more opportunities for other people.

And to do that, there are certain requirements as to how we listen to people. There are certain requirements as to how we accept different views and avoid imposing our own objectives or our own thoughts. Really remain open to what people bring to the table. Challenge people. Don't disappear and become invisible yourself. Challenge people appropriately in a way to expand people's thinking, not to impose one's own thinking. Throughout that process always keeping in mind the goal of advancing people's opportunities, not a goal of advancing ourselves and our careers and our feel good moments and all of those things. […]

I think it is valuable to not just to participate in IDDS, but I think it is valuable to promote the concept of enabling other people to be as good as they can be, whether they are IDDS participants or people in the community. That can translate into many different ways of enabling people to do the best they can do. I think those values are important to embed in any methodology to use to engage communities and train communities and support communities or participants or teams. — Former IDDS Organizer (S3)

Long-term follow-up for participants after the IDDS conferences, and additional curricula material are essential for sustaining a commitment to social innovation and to support the participants in continuing projects:

If you want people to continue a project that they have started in a training or they have another idea or if you want this to become embedded in the way they approach their lives, that is a long-term investment, which requires a lot of staffing. That requires curricula. So I think that if IDDS designs programs intended to support participants, it could focus a bit more on how intense the follow-up is. Not just with projects but with people. — Former IDDS Organizer (S3)

IDIN has developed resources to support IDIN Network members in staying connected with one another, finding mentors, and engaging in continued training.

Staying Connected

IDIN's Network members are spread all over the world, and thus communicating and staying connected has been challenging. This challenge has become increasingly difficult with

the scaling up of IDDS by offering multiple IDDS conferences per year. From 2007 to 2012, many of the IDDS organizers had been involved in organizing multiple conferences and could serve as Network connectors between different IDDS cohorts. With the transition to local organizing teams and themed, regional summits, there are fewer people who have in-person connections to those in other IDDS cohorts. IDIN has been trying to find ways to form connections within the IDIN Network between various cohorts of alumni who have attended different IDDS conferences:

> What I have been trying to do […] is figure out a way to mesh the different cohorts together. For example, we have changed our methodology. Before someone like [an IDDS participant] came to many IDDS's. We kept inviting him over and over again. Whereas now, we have a light touch. People cannot be participants in more than one IDDS. They can move on to be an organizer. There are fewer people that know other people in the network through the face-to-face experience. — IDIN Staff (S1)

One way that the IDIN Network Coordinator has been helping Network members in staying connected is by supporting local chapters:

> One of the projects that started a little while ago, was the idea that for local innovators to get the support they need, they have to develop a local vision of innovation. So based on that discovered need, we started helping Network members create local chapters. The idea is to get people to get together, work together, and start developing projects that they can tackle as a small group rather than individuals. We have about five or six of those around the world now, and I'm working with them so they can articulate and act on their local vision for the chapter.
>
> And these chapters take different flavors in different parts of the world. In Brazil, the chapter is engaged around the local Innovation Center there. In Tanzania, the chapter engages and supports post-IDDS projects. In Kenya, an emerging chapter is coming together around the idea of hosting an IDDS locally, so they're starting with small get-togethers and planning events. This is another kind of effort that we're doing to localize the Network. — Jona Repishti, IDIN's Network Coordinator (as quoted in McKown, 2015a)

Finding Mentors

Another clear area where Network members need support is mentorship. A former IDDS participant elaborates upon the need for mentorship:

> I think that perhaps if IDDS provided more mentorship and guidance that would have helped our projects move forward. We struggled a lot with certain questions and that we are trying to figure out, how to address certain issues. It was like a thought exercise in a lot ways, as opposed to someone with knowledge. I think we tried to reach out to a lot of people and try to get a lot of advice. […]
>
> When you are trying to solve a problem, and you don't necessarily know how to solve it, and there might not be a right answer, our tendency was to just stagnate on that. And having someone who was pushing us to, "Hey, you should do this or you should try to get your product here or there." That would have been helpful along the way at least because it was hard when we were working as part of this team to realize what we needed to do, as being part of the team. It was just hard for us to take a step back to be one step removed. What advice would you give this group? What would you do to make sense of it? — Former IDDS Participant (S6)

IDIN recognizes this need and has tried to develop mentorship resources that can provide guidance for projects, and also help teams maintain motivation and momentum:

> Sometimes only one person is working on a really big project. And then we really try to work with them, and see if we can help them find a team or find mentors and think about what other skills they need to bring in. — IDIN Staff (S1)

> The kinds of projects that our Network does can be isolating and disheartening because timelines are so long. We're really focusing on providing people that are working on projects with mentors, who don't just have the skills and knowledge, but who can also be cheerleaders and supporters for their mentees. I think getting our mentorship program up and running is really going to be a great way to provide more camaraderie and support for people on that long, difficult path. — Jona Repishti, IDIN's Network Coordinator (as quoted in McKown, 2015a)

<u>Engaging in Continued Training</u>

As a conference known for producing prototypes rather than papers, IDDS has attracted mostly technologists. The IDDS curriculum was heavily based on engineering design. Over the years, IDDS has realized that participants need more training in entrepreneurship and has been trying to integrate those lessons and skills in the curriculum as well. IDIN's Network Coordinator has also been working on connecting IDDS alumni (Network members) to other programs and resources to develop their business skills or help further develop their projects:

> Another project is to continue the capacity building for our Network members, and focusing in on the gap of social enterprise and business skills. We're figuring out ways in which we can pair Network members with incubators or accelerators in their countries.
> And finally, we're bringing in students and development professionals to work with people in our Network with active projects and social enterprises. Again, this is something we had been doing through the IDIN Consortium and classes, but we realized there is an ongoing need for people to recruit others with very specific skills to support their projects. We're creating a repository of Network member needs so we can match students with a start-up job in rural Africa or Latin America. — Jona Repishti, IDIN's Network Coordinator (as quoted in McKown, 2015a)

Also recognizing the limitations of what IDIN can offer alone, IDIN's Network Coordinator has been increasingly referring Network members to outside resources and networks:

> We also have to increasingly look at outside resources for ways of managing this growth. There are certain limitations to things that we can do with our resources. I really see IDIN being a Network of networks. We not only focus on providing opportunities within our Network, but also spend a lot of time connecting our Network members to other like-minded partners and organizations outside of IDIN who can support whatever their next step may be. — Jona Repishti, IDIN's Network Coordinator (as quoted in McKown, 2015a)

Staying connecting, ongoing mentorship, and continued training have all been critical to further developing projects that can scale, and to expanding the reach of the IDDS programs beyond the conferences.

5.5.2 Supporting Projects

By organizing IDDS conferences since 2007, IDDS has learned a great deal about common project pitfalls. Table 5.4 outlines possible causes, symptoms, and IDDS's solutions for some common project pitfalls that have occurred during IDDS.

Table 5.4. Potential causes, symptoms, and solutions for some common project pitfalls that have occurred during IDDS

PITFALLS	POTENTIAL CAUSES	EXAMPLES of SYMPTOMS	IDDS's SOLUTION
NO BUSINESS COMPONENT	IDDS presents the "Million-Maker" model as a dissemination model, in which individuals make their own technologies rather than buying mass-produced products.	"You don't do much market research in the beginning. You just see that individual, and what their need is, so we end up with doing a prototype that's really cheap and that they can use. It's a lot about the replication model, rather than something that could be scaled up or be turned into business." (S1)	IDDS has integrated business development into the curriculum.
TEAM OF TINKERERS	"We select people who are good at making things." (S1) Applicants are interested in making things." (S1) Applicants self-select to come to a conference that produces "prototypes, not papers" (IDDS, 2013).	"Projects are very much focused on the technology development without the market component." (S1)	Some IDDS organizing committees are selecting more participants with business experience.
NO BENCH-MARKING	IDDS believes that an concept is innovative if it is new to the team or new to the community, even if it is not new to the world.	"IDDS makes a very interesting choice to not give people examples of other technologies that exist in that space. People can do some research, but you don't see that much." – (S1)	Design facilitators can encourage teams to tailor the prototype to the local context.
BUILD-ABLE RATHER THAN HIGHEST POTENTIAL	The constraints of time and tool availability may result in teams selecting ideas that someone can use now or that is more easily buildable, but has low potential for scale.	"The time [period] of IDDS determines which projects or prototypes are selected to be made at the end. [...] People throw away a lot of cool ideas for the purpose of the idea that they can actualize and that someone can use in the community." (S1)	IDDS emphasizes that projects are the start of a journey and presents possibilities, but requires additional work to create impact.
DESIGN FACILITATORS ARE TOO INFLUENTIAL	Design Facilitators suggest ideas related to their expertise, even though it's not appropriate for the context.	"You have design facilitators that work very closely with individuals. [...] [An IDDS team] came up with this human-powered technology even though the village had electricity, for example." (S1)	IDDS has developed training materials for design facilitators. They are being trained to coach rather than direct.
TEAM / PROJECTS MISMATCHED	Working on projects outside one's expertise provides opportunity to cross-pollinate ideas or think out of the box. Teams are formed based on participants' preferences, and participants may choose projects that are not related to their community or expertise.	Team member has expertise but is matched with a project not leveraging that expertise: "We had a guy that was from this basket-weaving community, and there was a challenge around getting more efficient tools or ways of weaving the baskets and adding value to the process. But this guy from this community was on a different challenge, and so he went back, and there was very little continuation of the project at the community level." (S1)	Some IDDS organizing committees are more heavily considering relevant expertise or the need for a community liaison, in addition to individual preferences when forming design teams.
COMMUNITY / PROJECTS MISMATCHED	In order to more easily convene community groups, teams may work with powerful stakeholder groups that may not include the end-users of the technology.	"[The widows] were more independent so they were the ones that could convene the women. But they were also a lot older in age, and they didn't have their periods anymore so they didn't have any buy-in [for the sanitary pad project]." (S1)	IDDS has been investing more resources to conduct more thorough needs assessments and to identify local champions.
POOR PROBLEM FRAMING	"Sometimes a problem that is framed really broadly is really a bad idea if your purpose is to get a product out the door by the end of the summit. But it would be really great if the idea were to have students really muck around for a while and really try to get their heads around something. It might be really frustrating in the longer path but maybe they will learn more than someone who is given a really easy challenge." (S11)	Problem is too big to address during the available time. The team must agree to narrow down the project to be relevant for their partner community and doable during the conference. Problem is too narrowly defined and specifies a limited solution set that excludes promising solutions.	IDDS has developed problem framing guidelines to ensure that all projects will be relevant to the partner community, and that significant progress can be made during the timeframe of the conference.

Although IDDS teams may successfully identify a promising solution or create a viable prototype during IDDS, it is unlikely that they would be able to develop a scalable product during the five-week timeframe of an IDDS conference. Thus, project continuity is an important goal. As of 2015, 43% of projects (19 out of 44 projects) initiated at IDDS conferences from 2007 to 2013 were considered "active," as defined by a stakeholder group continuing to make progress on developing the technology or business (Repishti, 2015, p. 2). The stakeholder groups that IDDS hopes will continue working on IDDS projects are IDDS participants, community members, partner universities, other institutions, or Innovation Centers (Repishti, 2015, p. 4). There are several different ways in which projects may continue beyond IDDS. One of the stakeholder groups may continue developing the IDDS prototype, develop an alternative solution to address the same problem, or disseminate the design as an educational module (Repishti & Vogel, 2015a).

IDIN recognizes that there are several challenges contributing to the difficulty participants face in continuing to work on projects after the IDDS conference. Some of the challenges for project continuity include the following (Repishti, 2015, p. 3):

- disconnection from the users and context
- dispersion of the team across multiple time zones after IDDS
- participants have other priorities (e.g., work, other projects, etc.)
- no project champion
- IDDS prototype was not ready for scale or was not the appropriate solution
- lack of resources (e.g., funding, tools, etc.)
- lack of support (e.g., mentors, infrastructure, etc.)
- long timeline needed to develop products and ventures, or achieve social impact

Some of these factors are beyond the influence of IDIN. IDIN is experimenting in providing support and resources to address the factors that are within their influence:

> We are still learning as an organization how to have a part of the programming and part of the process support the potential for those things to go forward to their natural outcome or some follow through. — IDDS Faculty (S2)

The following sections will describe various ways in which IDDS is trying to increase the likelihood for project continuation by improving problem validation, problem framing, participant selection, and funding.

Problem Validation

From 2007 to 2012, all IDDS organizers were volunteers and had limited time and resources to conduct needs assessments and problem validation. Problem validation means conducting the due diligence needed to determine whether the problem identified is actually associated with real user needs. Former IDDS organizers from 2009 and 2012 reflected upon the importance of problem validation and the need to dedicate more time and resources towards it *before* IDDS conferences start:

> There were a bunch of ideas, design challenges that were based upon trips we had taken. These were not the ideas that were generated in the community in 2009, per se. These were ideas that filtered in perhaps from [a local liaison] and local IDDS [organizing] committees. All of them were things that [IDDS Faculty, Subject 2] and [the Director of IDDS] and few other people who were organizing (I don't remember exactly who) thought this might be an interesting challenge. […]

> If you are asking me about 2009, there were preliminary visits. It is like one conversation or one group meeting. If you ask people, "Is tomato farming a problem here?" They will say that, "Yeah, it is problem. It is a big problem." That is not sufficient. So I think in those days, there was minimum validation. In those days, I think there was the kind of shoddy work that people teaching the IDDS curriculum would describe as shoddy work. — Former IDDS Organizer (S3)

> We really need to understand problems before we have the teams working on them and there needs to be a certain amount of background research done. We have things where we had formed the team working… In 2012, working on how to improve flooring in this community… Because we did a very cursory glance, and we looked at the one or two houses that assessment team went to and saw that they weren't good. But then when they went in and looked around in the community, this project just was not applicable to this one community. […] It is just one of these things where if we don't do our homework enough, we are just making the teams spend a month trying to solve a problem that is not a problem or a well-defined problem. That is kind of our bad. It doesn't make sense. The time investment we need to decide what good projects are or aren't should be a much stronger part of creating a summit. That is more important than the curriculum that we are designing or where we are staying or which community we are going to. — Former IDDS Organizer (S6)

A former IDDS organizer describes a vision for how problem validation would ideally be conducted:

> Actually get ideas driven from the community as from the inception. I think that would make a huge difference. Theoretically, the local organizing committees can do that. They have enough lead time to do that. They should not be just fundraising, making reservations in hotels and such or guesthouses or whatever. They should be out in the communities really talking and going through the processes. Multiple times, collecting lots of ideas and challenges in different ways - through cell phones to get data - having some tools and then filter them down, come up with some ideas, then go back. "Would you all be excited about working on stuff like this with us if that really happened?" And really have a process so that a lot of the buy-in time that is spent is already done before the summit starts. — Former IDDS Organizer (S3)

Moreover, IDIN has developed a set of guidelines for project selection (see Section 6.3.2), which requires organizers to ensure that the problem is addressing real user needs.

Project Framing

IDDS recognizes the influence of problem framing on the likelihood of project success:

> One factor is a well-framed problem. The earliest thing that can be done to support project success is to frame the problem correctly at the beginning. Part of that is on the organizers and on the participants. If the problem is identified correctly, that is a huge factor in whether something is going to be a success. — IDIN Staff (S11)

From 2007 to 2010, most IDDS projects were selected and framed by IDDS's core leadership:

> For a very long time, people deferred to [the Director of IDDS] and [IDDS Faculty, Subject 2] to come up with what the challenges would be and to frame them appropriately. How to frame a challenge so that there is enough design space. Very few people jumped in on that to say, "Well, let's talk about that. Let's figure it out. I can do that too." — Former IDDS Organizer (S3)

With increasing autonomy given to local organizing teams, the responsibility to identify and frame projects has shifted to first-time organizers who may not have the same expertise and intuition as IDDS's core leadership:

> [IDDS Faculty, Subject 2] and [the Director of IDDS] know what makes a good problem. But if you have an organizing team that does not have much background in problem identification and understanding then that might be hard for them to look at a problem, really dig and understand that this is a good problem, or this a bad problem or this has a good design space, or is this an implementation problem or is this a problem where this a reasonable designable solution for. — Former IDDS Organizer (S6)

IDDS tries to identify projects that are important to partner communities, and also addresses a broader development challenge with potential for impact at scale (Linder & Vogel, 2015). Even though some projects might not achieve the intended impact through the output of the project, IDDS considers projects a success if they helped participants learn the co-creative process:

> It's not necessarily just the output of the project that matters to us, but the whole process. […] If there's a project that opens up people's minds to think in a new way and gets them to know the design process, the co-creative design process, that's a big win. […] Because it's getting people together, and they're learning the design process. And who knows, they might actually take that and use it later. I know that takes a lot more faith; that's something that's not quite as measurable, to be able to say we have this game-changing thing, but really the game-changing is the mindset, and not just the product. The product is also a big win, but so is the mindset. Getting people to learn the co-creative design process is a big win. — IDDS Staff (Linder & Vogel, 2015)

There are some tensions between optimizing a project with high learning potential and optimizing a project for the highest likelihood of success. An IDIN staff member comments on how sometimes framing a problem broadly can be frustrating but potentially more educational:

> Sometimes a problem that is framed really broadly is really a bad idea if your purpose is to get a product out the door by the end of the summit. But it would be really great if the idea were to have students really muck around for a while and really try to get their heads around something. It might be really frustrating in the longer path, but maybe they will learn more than someone who is given a really easy challenge. I don't know that it is. I am not sure yet what provides a good learning experience. It is hard to say. — IDIN Staff (S11)

To help new organizers navigate some of these complexities, IDDS has developed a set of problem framing guidelines (see Section 6.4.2). IDIN is also continually learning by asking design team coaches to reflect upon the quality of problem framing after each IDDS conference. In this way, they hope to learn empirically effective problem framing strategies.

Participant Selection

Each IDDS conference is organized by a different organizing committee, which may use different criteria in selecting participants for their particular conference. Yet, each IDDS organizing committee seems to include diversity and the IDDS spirit as key criteria:

> There are a number of things that we looked at. Do they have the IDDS spirit? That is the first thing we look for. IDDS spirit is not just passion, not just commitment. It's the can-do attitude and the making-things-happen attitude that sets our participants apart. The ability to be able to leave your comfort zone and walk in dire or difficult situations because your motive is to make a difference to the community you are working with to create a product or pilot or prototype that has all the markings of being able to address the challenge that you're trying to address. […]
>
> In keeping with IDDS spirit, we also tried to achieve true diversity in our participant mix—people from different geographies, walks of life, and different sectors—that same diversity that IDDS and IDIN have come to be known for. — Habib Anwar, Lead Organizer for the 2015 IDDS Aarogyam in Chennai, India (as quoted in McKown, 2015e)

> Based on the IDIN philosophy, having people from across the world to keep the IDDS spirit of working with people from all walks of life. — Thabiso Blak Mashaba, Lead Organizer for IDDS D'Kar in Dekar, Botswana (as quoted in McKown, 2015e)

IDDS believes that diversity is important for innovation and recruits people from all over the world. However, the dispersion of the team across multiple time zones after IDDS makes it challenging to continue progressing on projects. A former IDDS participant reflected upon how it might be difficult to return home as an individual after IDDS and having to form a new team:

> In general with IDDS, you have this super high-energy atmosphere where people are not sleeping for a month because they are so excited about working and spending time with everyone. And then, you go back and there is this post-IDDS drift in energy. Some people will be like, "Oh, it is time to sleep now because I am done with IDDS." But I mean really if you are going into an environment after that, that is where you are not working on the same project, for certain people it might be really different. If you are going back to your community and you are the only one who has gone through this IDDS experience, then it might be harder to relate to. But for me, I was coming back to […] a university setting where there are lots of people around and a very high energy atmosphere, as it is. So I did not feel like I was by myself. I could find someone or grab someone and say like, "Hey, work on this with me because I need help, and I don't want to work on this alone." But it would be hard to work on this in places where like one person is coming from a community and going back to that community. — Former IDDS Participant (S6)

IDDS also recognizes that participants have difficulty finding opportunities to work on international development projects if their IDDS project was not one that showed potential for continuation (S6):

> One of the things I've been pushing for is this idea that when we choose projects… Not every project is the same and not all projects set themselves up to success by the end of the summit. The success of the project does not reflect the success of the individuals working on the project or the passion of the individuals working on the project. If people want to move forward with the projects in IDDS, the only vehicle I know to go forward, is that I spent a month doing this project so I am going to spend a lot of time working on this project. But if the project was not one of the more sensible projects to invest a lot of time and skills into, it's a thing that I have been trying to push back on. And maybe projects are vehicles for learning, and that at the end of this, we should allocate people who have time and availability and energy and enthusiasm to continue working on something and to direct that into something more meaningful that they can do.[…]
>
> If you looked at the final reports from IDDS, there were some projects that had a lot of potential to grow, and there were some like, "This was great for this one community, but this is not scalable. We can't grow this." — Former IDDS Organizer and Participant (S6)

IDDS has been trying to address these challenges by providing opportunities for IDDS alumni to reach out to the IDIN Network through email and social media for help on projects, including recruiting team members.

Rather than supporting *individual* innovators, IDDS might consider supporting innovation *teams*. It may be possible for IDDS to restructure their program to optimize the opportunity for design teams to continue collaborating after the conference, as well as producing personal transformations. For example, IDDS could form design teams of individuals speaking the same language, located in the same geographic region, but with sufficient diversity of culture and life experience to stimulate a personal transformation at the conference level.

Some IDDS alumni cannot continue their IDDS projects because they have other priorities and commitments, such as jobs and school. IDDS organizers have begun to include potential for continuity as a criteria for participant selection:

> I'm a firm believer of continuity. That was key for us in the applicants. We can tell who might be more likely to take projects forward after the summit. That's what we're looking for first and foremost after the interest in desert communities. — Thabiso Blak Mashaba, Lead Organizer for IDDS D'Kar in Dekar, Botswana (as quoted in McKown, 2015e)

> The next-most important question is "Are they interested in continuity, or is it just an activity for their CV? Are they really trying to make a difference for the greater global good?" — Habib Anwar, Lead Organizer for the 2015 IDDS Aarogyam in Chennai, India (as quoted in McKown, 2015e)

As a conference focused on producing prototypes, IDDS tends to recruit and attract technologists. An IDIN staff member comments, "We select people who are good at making things, are interested in making things" (S1). However, difficulties arise when projects only focus on the technical challenges without considering the business model or dissemination plan:

> Definitely, business acumen is huge. It is really hard for projects to get off the ground if everyone on the team just wants to keep tinkering with it and no one wants to be the one to turn it into a business or knows how to do that. So the business skills are huge. […] [Business acumen means having] skills in business plan design. Skills in thinking about distribution channels and any kind of orientation to what it is going to take to take this thing off the ground, like skills in marketing. […]
> Targeting is a big. We talk a lot about it internally, like how we choose participants. Because we have a lot of separate missions when it comes to bringing in participants. The philosophy of IDIN is that everyone can be innovative and philosophy is to bring diverse teams that represent a wide range of skill sets because we think in the intersection of these perspectives, lies innovation. […] And we believe that better innovation comes out of better involvement. We do try to target people with entrepreneurship experience and business experience but we don't want to only target those people because we think that bringing in people with anthropology backgrounds and farming backgrounds and bike repair backgrounds is going to be just as valuable as the people who have been entrepreneurs in the past. — IDIN Staff (S11)

Sometimes IDDS places participants on projects that are not in their area of expertise to facilitate an opportunity to learn.

> Sometimes the learning experience comes out of doing a project that is really far out of your comfort zone. Sometimes it is better to do something in your comfort zone so that you can push it further, and you can challenge yourself to think beyond the way you usually think because you are comfortable with one aspect so you can push yourself more instead of getting lost in it. — IDDS Staff (S11)

However, these decisions sometimes result in lack of project continuity.

> We had a guy that was from this basket-weaving community, and there was a challenge around getting more efficient tools or ways of weaving the baskets and adding values to the process. But this guy from this community was on a different challenge, and so he went back and there was very little continuation of the project at the community level. — IDDS Staff (S1)

For the new themed IDDS conferences that focus on topics, such as waste management, IDDS organizers have experimented with selected participants based on relevant experience:

> We've been going for breadth so far, bringing the widest possible variety of individuals into our Network. But now, I think we're increasingly moving toward a more specialized model. Even with IDDS, we're developing summits that are more themed in nature: humanitarian relief, medical technologies, desert livelihoods, and waste. We're already specializing when we start, which will bode well for connecting communities of practice as we grow. — Jona Repishti, IDIN's Network Coordinator (as quoted in McKown, 2015a)

> We tried to get a very diverse group, both culturally, but also in terms of the experience they bring. One of the things that makes our summit special is that it's not just about building technologies, but also about building the system around those technologies, and building a system that is inclusive of waste pickers as entrepreneurs. Many of our participants are from the business world, engineering, systems design, grassroots businesses, and waste picker organizations all over the world.
>
> About 35-40 percent of the people that were chosen were waste pickers themselves, and not just from Colombia, but also from Nicaragua, Kenya, and India. They come with great entrepreneurship and activism experience. They're very savvy in terms of local technology and how to build a locally inclusive waste management system. — Pedro Reynolds-Cuéllar, lead organizer for IDDS Zero Waste in Cali, Colombia (as quoted in McKown, 2015e)

In addition to selecting participants based on relevant experience in particular project sectors, IDDS might also consider selecting participants with skills and experience that are relevant for design for scale and manufacturing (S3):

> You can address that [gap about design for scale in the IDDS curriculum] a little bit by team formation. If you think about people who come from particular industries, maybe you can do a better job of selecting people and making sure that there is somebody who thinks that way on teams. I think that [IDDS Summit Coordinator, Subject 8] is looking a lot at the selection process as a way to up the game. Passion alone is not enough for IDDS. If you up the expectation and the experience level that you are expecting, that is a better formula for having teams that do include community voices and user voices and also have people with serious skills that can exchange experiences with different things that can contribute to embedding some of the ideas you want embedded in the design from an earlier stage about how it is going to manifest in the world - what the diffusion will look like early-on. — Former IDDS Organizer (S3)

The new IDDS formats of one-week or two-week conferences may enable experts to participate. It may also be possible for experts to assist with specific tasks to help projects progress, even if they cannot commit to being core team members. IDDS teams might also address skill gaps by recruiting or outsourcing.

Funding

IDIN is working to provide funding for IDDS projects to continue. IDIN's Network Coordinator describes the pipeline of funding that was launched in August 2014:

> One thing that started to become clear was that people in our Network get inspiration at IDDS and start prototypes, but there is a dearth of resources after IDDS to continue prototyping, especially when they return home. So one of the first big projects that I launched was microgrants, small grants to help support the development of technologies after IDDS.
>
> And then we started learning that there are different kinds of funding that people need at different times. So now our microgrant program is a three-part funding series. It starts with picogrants, which are very small grants to cover a discrete step in the prototyping process. Microgrants are the second step, and allow Network members to become part of a larger community. And then the third step, is the MIT D-Lab Scale-Ups Fellowship, a $20,000 grant that allow people to start to work on their project almost full-time. We're trying to cover the whole cycle of needs. — Jona Repishti, IDIN's Network Coordinator (as quoted in McKown, 2015a)

This funding pipeline has helped several IDDS projects progress. IDIN funds may help IDDS teams conduct additional fieldwork with users in the context of use. An IDDS alumnae reflected upon how IDDS and the IDIN Network has supported her project:

> The [IDDS] summit helped us a lot because that's where we could take Zimba as our project to be worked on during the summit. We got a lot of help, got new team members that way, so it was wonderful.
>
> Beyond that, the network itself has brought a lot of people, and supported the Zimba even beyond the

> summit. […] One of the [IDDS] faculty members, gave us a ton of advice on design and manufacturing of Zimba, who we would only have got connected to really because of this. And [IDDS Faculty, Subject 2] as well.
> We hear about the funding opportunities from IDDS, IDIN network people, forwarding us, "Oh, there's this water competition that you might want to check it out." There've been people on the network that have joined Zimba to help for a various amounts of time, who didn't even work on the Zimba team even during the summit. It's just connected that way. Yeah, the network has been very supportive in that form. And directly, because of the microgrants. Very directly supported financially, as well. — Zimba Team Member (S5)

Even though IDIN funding for projects has been helpful, it is even more difficult to find funding for full-time salaries or stipends:

> [Zimba Founder] did bring up a good point that some networks or institutions will offer fellowships that cover people's time that you can be sustainable for yourself and dedicate full-time to this and not have to work on it on the side. [Zimba Founder] actually had to work on the side quite a bit before getting the D-lab Scale-Up Fellowships. […]
> We found some opportunities, but usually they don't cover the entire time. Like, they cover the part-time or a piece of it. Even the D-lab Scale-Up fellowships covered him $5,000, $10,000 a year? I think it did get bumped up to $10,000, but not necessarily the full-time support that he was looking for, for his family. So that is one area that I'm not sure that this network is the right place to provide it, but maybe if the network could help people who want to go full-time connect to better resources for that, that seems to be a really hard area to find the funding for. — Zimba Team Member (S5)

Although IDIN recognizes this need, IDIN does not have the resources to be able to fund salaries and stipends (S1).

There also appears to be a gap between what IDDS can provide ($50 to $300 picograms for prototyping, $500 to $2000 microgrants for moving projects to the next stage) and what is needed to be eligible for other funding sources. MIT's Scale Ups Fellowships provide $20,000 for entrepreneurs who can dedicate at least 80% full-time (the equivalent of 32 hours per week) for one year to their venture, and have a proof-of-concept prototype that has been tested with users, and a business plan. Most IDDS projects have not developed a business plan or plan for scale, and are thus not eligible for the Scale Ups Fellowships:

> I'm working a lot with [Scale Ups Coordinator, Subject 10] to create this pipeline of funding – is: we do picograms now that are $50 to $300 that are very stopgap [temporary fix] needs (e.g., prototype refinement if someone is already working on a project). We have them in Zambia and Tanzania. And microgrants are a little bit bigger, and people can apply up to three times so hopefully it could be a recurrent process. And then Scale-Ups, but our projects are not going to Scale-Ups. […]
> There's very few projects that individuals are working on (whether they start IDDS or whether they're personal projects) that fit the criteria for Scale-Ups. The criteria for Scale-Ups is that you have some proof of concept and you are willing to work on it, dedicate it at least 80% of your time, and you have the sense of market and business. How this will scale? A lot of our microgrants projects are very much focused on the technology development without the market component; customer-orientation is radically missing. — IDIN Staff (S1)

> Usually the prototypes are very much focused on building one thing without an idea of whether it can be sold, how would we use it, whether it can become income-generating for that individual or whether it can benefit the community. — IDIN Staff (S1)

An IDDS participant, whose team benefited from the Scale-Ups Fellowship, comments on how funding is still a challenge. One suggestion is connecting teams with a mentor who can help the team develop a business plan and scale-up strategy, and improve their grant-writing skills:

> The other thing that I think will be super helpful will be for IDDS to help teams raise more money and make that as a resource because you really cannot do anything if you don't have money. […] We spent so much time trying to find money that it made it hard to do actual work. Every time a grant comes up, I only have time to either do engineering work or the grant writing. If we don't have the funding to do the engineering work, I need to focus on grant writing. And none of us are really good at grant writing.
>
> We have not gotten any grants in the past couple years. We haven't won any awards or gotten money. So every time you apply to something and get rejected by it, it is sort of like this emotional up and down. After that happens for a couple for years and you have not been able to raise any money, then there is no point to write another grant application you are probably not going to get money. I don't know why we are not getting selected for these grants. We don't really know.
>
> But if we had someone who said that, "Hey guys, you should do this." Or "Hey, I write grants. I'll look at what you have written, and help you put together a better proposal so that you can get funding." Or someone who is like, "You are not getting funding because this is your business model, and this model does not work so you have to rethink this entirely. It is a hard thing when you are working on a team and trying to figure that out by yourself. — Former IDDS Participant (S6)

Thus, along with ongoing support for people, IDDS has developed better capabilities in project scoping and validation, in structuring team and choosing participants, and in finding funding models for ongoing work. These have allowed IDDS to extend participation in projects over time, and thus grow potential impact.

5.6 Discussion

IDDS was founded in 2007 as a standalone program with a multifaceted mission of achieving impact through design practice as well as design education. There is anecdotal evidence that IDDS is achieving its design education goal (see Table 1.2 in Section 1.3 and Section 5.3.1). Many IDDS participants self-reported that IDDS inspired them to become social innovators, but few IDDS prototypes had been adopted by users.

Using the Social Blueprint framework, I will present some of the changes initiated between 2012 and 2015 to better sustain engagement in social innovation and support projects in developing scalable products (see Figure 5.7). It remains to be seen how IDDS's Social Blueprint will continue to evolve to address a multifaceted mission.

Anchor Purpose
"To support a global network of innovators to bring technologies that solve problems in poverty to scale" (IDIN Staff, S1)
Design Education: To build capacity for technology creation in developing countries
Design Practice: To create technology for poverty alleviation

Key Partners

MIT and other universities that host IDDS conferences

Key Activities

Teaching and practicing HCD

Project-Based Learning model

Community building activities

IDIN Network supports former IDDS participants in developing scalable products and social enterprises by providing funding, mentorship, and other resources

Key Resources

IDDS Director has strong connections to MIT and a network of alumni, students, and other educators

Instructors have expertise teaching design, engineering, and international development at world-class universities

IDDS *organizers* are volunteers

IDIN Staff (e.g., Network Coordinator and Summit Organizer)

Value Proposition

5-week conference and HCD projects:

Build *participants'* capacity to create technology for poverty alleviation

HCD projects have potential to improve quality of life in *partner communities*

Organizers want to help realize IDDS's mission of creating and supporting social innovators

The funder hopes that IDDS will develop scalable breakthrough technologies to address challenges of poverty

Stakeholder relationships

Participants and *organizers* have strong social bonds with one another, and are considered part of the IDDS family or tribe.

IDIN Network

Participants develop relationships with people in *partner communities* to co-create technologies

Channels

IDDS recruits *participants* through the internet and existing design and development courses or programs at partner universities

IDDS develops relationships with *partner communities* through host universities

IDDS is not an implementer, and instead supports participants in developing technologies and social enterprises to serve *beneficiaries*

Stakeholders

Participants are interested in learning about or delving deeper into design, entrepreneurship, and international development

Most IDDS *organizers* were former participants

Partner communities are low-income villages or urban areas that collaborate with IDDS on projects

Beneficiaries are low-income individuals who benefit from products, services, and programs

Funder

Cost

IDDS conferences (e.g., travel expenses, health insurance, materials, etc.)
IDIN Staff, support and resources for IDIN Network, Microgrants, etc.

Differentiation

IDDS brings people from all over the world and various walks of life to live together and create technologies to address issues of poverty
Social Innovation Ecosystem (e.g., IDIN Network, Microgrants, etc.)

Revenue Streams

Small grants (from foundations, nonprofits, etc.) for each IDDS conference
5-year grant for IDDS conferences and IDIN (Network, Microgrants, etc.)

Magnitude

Annual conference on broad topics (e.g., agriculture, health, and education)
Multiple conferences per year on specific themes (e.g., urban waste systems)

Figure 5.7. 2015 Social Blueprint showing IDDS's shift from a standalone program to becoming part of IDIN's Social Innovation Ecosystem (in *blue).

Pivot from a standalone program to a Social Innovation Ecosystem

Forming design teams of budding innovators and teaching a design process emphasizing co-creation is aligned with IDDS's Value Propositions of inspiring people to work on innovation and IDDS's Anchor Purpose of increasing capacity for technology creation in developing countries. Although a five-week conference appears to be sufficient for achieving that aspect of IDDS's mission, it is not sufficient for producing scalable products. The timeframe of a conference is too short, resources are limited, and most members of the design team are novices in design and entrepreneurship.

In the previous chapter, I described how IDEO.org shifted from a single program with a dual mission of design education and design practice towards offering multiple programs, each with a focus mission. In particular, IDEO.org discontinued the Fellowship program, and transitioned from the Project-Based Consulting Model to the Programmatic Model to better serve the goal of achieving measurable impact through design practice. In other words, IDEO.org changed its Anchor Purpose and the corresponding building blocks of its Social Blueprint to better align with its core competency of design practice.

In contrast to IDEO.org, IDDS could not focus solely on the design education aspect of its mission. IDDS's approach to design education is inherently linked to design practice. IDDS believes that authenticity is essential for creating a transformative design experience. For IDDS, authenticity means co-creating technologies with low-income communities by collaborating on projects that have real potential for social impact. In order to better support its multifaceted mission, IDDS needed to expand from a standalone program to an integrated system of programs, partnerships, and resources that could provide long-term support.

It is interesting to note that both IDEO.org and IDDS expanded beyond a single design experience to provide long-term support. In the previous chapter, IDEO.org shifted from 12-week design projects with the Project-Based Consulting Model to planning for multiple design engagements throughout yearlong or multi-year partnerships in the Programmatic Model. For both IDEO.org and IDDS, long-term support entails providing additional capacity building to help people (IDEO.org's clients or IDDS's alumni) continue to practice HCD, and to navigate challenges encountered during the implementation of projects.

In 2012, USAID awarded a five-year $20 million grant (Revenue Streams) to expand the IDDS program into the International Development Innovation Network (IDIN) and a Social Innovation Ecosystem. USAID's emphasis on the importance of developing scalable products (Value Propositions) stimulated corresponding changes in the Social Blueprint. With the expansion of IDDS from a standalone program to the IDIN Social Innovation Ecosystem, IDIN could address a larger mission. Whereas IDDS's Anchor Purpose remains focused on inspiring people to believe that they can make a positive change in the world, IDIN's Anchor Purpose is "to support a global network of innovators to bring technologies that solve problems of poverty to scale" (IDIN Staff, S1).

The IDIN Social Innovation Ecosystem consists of various programs and resources to better support people in sustaining a commitment to social innovation, and to support IDDS projects in becoming scalable products. The IDIN Network is the program that most directly affects IDDS. Former IDDS participants and volunteers are automatically included in the IDIN Network (Stakeholder Relationships). The IDIN Network Coordinator supports former participants in developing scalable products and social enterprises by providing funding, mentorship, and other resources (Key Activities). The IDIN Network Coordinator has created several ways for Network members to stay connected and engaged in social innovation through

LinkedIn, Facebook, the IDIN website, and email lists. These resources help Network members find new project teammates, mentors, or opportunities to study and work in social innovation. New funding opportunities, such as the IDIN Microgrants and Scale-Up Fellowships, provide grants of $50 to $20,000 to support the development of prototypes into products and the launch of social enterprises. Innovation Centers have also been started in various developing countries to provide a workshop space, tools, and training staff to help people learn about design and work on social innovation projects.

Pivot from a breadth of project sectors to themed summits

From 2007 to 2012, each IDDS conference tackled projects spanning a diverse array of sectors, including agriculture, health, and education. IDDS needed a broad array of projects to satisfy the needs and interest of their diverse group of participants (Linder, 2015a). Participants typically came to IDDS with interests in particular sectors and if there were no projects that aligned with their interests, participants might be unengaged and might not experience the transformation that IDDS hopes to catalyze (Linder, 2015a). However, with this model, design teams might have few or no members with relevant experience in their project sector.

From 2013 onwards, IDDS began to experiment with themed summits, focusing on topics such as rethinking emergency relief efforts or improving urban waste systems. Focusing each conference on a thematic topic enables IDDS to form design teams consisting of stakeholders across the value chain (e.g., users, customers, manufacturers, etc.) and increases the potential for co-creation. The themed summits also enable IDDS to recruit participants, design facilitators, and guest speakers with expertise in the project sector. Design teams can thereby have more members with relevant experience in their project sector, as well as increased access to sector experts. These experiments will hopefully result in prototypes with a higher potential for becoming scalable products.

In the previous chapter, I described how IDEO.org had transitioned from working across a variety of project sectors (e.g., water, sanitation, agriculture, health, financial services, gender equity, and community building) to focusing on the programmatic focus areas of financial inclusion and reproductive health for teens. It is interesting to note that IDDS initially worked across multiple sectors, and eventually decided to focus on a single theme or sector for each conference. Focusing enabled both IDEO.org and IDDS to recruit personnel and partners with relevant experience and expertise in the project sector. In theory, involving more stakeholders with relevant experience and expertise has benefits for both co-creation and increasing the likelihood of project success.

Pivot from technology-focused to integrated innovation

From 2007 to 2009, IDDS conferences had various themes, such as producing prototypes not papers, developing technologists as well as technologies, and collaborative co-creation with community members. The design process for these initial IDDS conferences was focused on the development of prototypes and technologies. The Director of IDDS believes that building capacity for technology creation in developing countries is critical for sustainable development. In addition, since IDDS's instructors have engineering degrees, it is understandable that IDDS conferences would focus on technology and not business design. However, it eventually became clear that business models were needed to sustainably disseminate the technologies at scale. In 2010, the IDDS conference at Colorado State University focused on developing prototypes into products and projects into ventures; it was the first IDDS that emphasized entrepreneurship and

the design of business models. In 2011, IDDS integrated the design of technology and the design of business models into a curriculum for "Integrated Innovation."

Pivot from IDDS core faculty to local organizing committees

From 2007 to 2011, IDDS core faculty members organized IDDS. Experts with experience-based grounding led key activities, such as project selection and problem framing. While IDDS was still developing its philosophy and curriculum, it made sense for IDDS' core faculty members to be in charge of the most challenging aspects of organizing an IDDS conference. However, IDDS's core faculty members only had the time and resources to organize one IDDS conference per year.

With a new funder and a new emphasis on achieving impact at scale, IDDS needed a new model to scale up the number of people reached through IDDS conferences. In 2012, the IDDS conference was primarily organized by volunteers in Brazil. IDIN's Summit Organizer has been supporting local organizing teams in developing countries to organize multiple IDDS conferences and reach more participants each year. IDDS core faculty members and former organizers have also been developing training videos and training guides to support local organizing teams in modifying and delivering the IDDS curriculum.

It is interesting to note the contrast between IDEO.org shifting towards increasing expertise, and IDDS moving from an expert-led organizing team towards decentralization. In the previous chapter, I described how IDEO.org initially sought design team members with hybrid experiences in design and the social sector, but shifted towards hiring people with specialized expertise in either design or the social sector. IDEO.org's shift towards recruiting for expertise is likely to help them achieve their goal of achieving measurable impact through design practice. IDDS's shift from having IDDS's core faculty lead organizing efforts towards supporting local organizing teams is aligned with their mission of capacity building. Supporting local organizing teams also enables IDDS to scale up its program by hosting multiple conferences per year.

The next chapter provides a high-level comparison of the design processes of IDEO.org and IDDS. I highlighted the differences in IDEO.org and IDDS's design processes to demonstrate that HCD is not a static process, but rather one that is adapted to the context of the people and projects involved.

Chapter 6

Comparison of the Design Processes of

IDEO.org and IDDS

6.1 Chapter Overview

IDEO.org's and IDDS's design processes can be categorized as Human Centered Design (HCD). Although the design process and methods may vary in practice, the approach may be considered HCD if design decisions are guided by the needs of potential users or people whose experiences will be transformed by the design (Dym et al., 2005; Gasson, 2003). The prioritization of user needs distinguishes HCD from other product design approaches, such as "technology push" in which technology is the driver of a project, or "market pull" in which economics are the driver. IDEO.org's Executive Director describes the HCD process, as follows:

> Human-centered design is a creative approach to problem solving. It's an approach where we start by understanding people's needs by spending time with them, by conducting interviews, by doing observations, by doing home stays, and trying to deeply understand people's needs. [Meanwhile, we're] going through a process of synthesis where we distill them into a set of insights and opportunity areas, where we brainstorm a wide range of different solutions, and then choose a few of them to prototype and then continue to evolve. Then, we share those prototypes with others and then get feedback on them and ultimately with the refined solution, communicate it effectively. — Jocelyn Wyatt, Executive Director of IDEO.org (as quoted in Skillbridge, 2015)

HCD is a fluid process that is most effective when it is adapted to suit different contexts. It is not a standardized static process, in which the same sequence of steps and methods are applied in all contexts. There are many ways to represent the HCD process.

In this chapter, I provide an overview of the design processes taught and practiced by IDEO.org and IDDS. IDEO.org represents the design process as three overlapping spaces of Inspiration, Ideation, and Implementation (IDEO.org, 2015e, p.11). One can "think of *inspiration* as the problem or opportunity that motivates the search for solutions; *ideation* as the process of generating, developing, and testing ideas; and *implementation* as the path that leads from the project stage into people's lives" (Brown & Wyatt, 2010, p. 33). For IDDS's design process, "the first stage is to gather information and gain insights so that you can really *understand* the

problem at hand, the second stage is to *think of ideas* and generate many alternatives so that you can choose the best approach, the third stage is to *implement* and validate your solution to learn as much as possible" (IDDS, 2014, p. 1, emphasis added). For ease of comparison, I chose to represent the design process as the three phases of Understanding, Ideation and Prototyping, and Implementation.

Since IDEO.org and IDDS are continuously evolving, there are many possible combinations of strategies and methods used in the design process. This chapter is not a comprehensive review of all the methods used by IDEO.org or IDDS. IDEO.org's Field Guide to Human-Centered Design contains methods that have worked well in their experience designing for the social sector (IDEO.org, 2015e). IDDS's Design Workbook is geared towards designing small mechanical devices (Smith, 2015f). IDDS faculty selected methods that are likely to work well with diverse groups of adults and adapted them to fit the IDDS curriculum (IDDS, 2014). What follows is a summary of IDEO.org's design process and IDDS's design process:

Summary of IDEO.org's design process

Born out of IDEO, it is natural that IDEO.org would exhibit some characteristics of a design consulting firm. Since IDEO.org's partners have expertise in particular areas and established programs, IDEO.org is constrained in scoping projects that align well with their partners' existing priorities. Similar to other consulting firms, IDEO.org design teams conduct expert interviews to quickly learn about the key issues and main theories related to their projects. Design concepts are selected through design reviews with Creative Directors or Senior Designers. The level of refinement and professionalism of IDEO.org's design deliverables are geared towards gaining credibility and making a compelling case for partner organizations to implement the recommended concepts.

Summary of IDDS's design process

With the Creative Capacity Building Approach, IDDS is trying to build capacity for technology creation in developing regions. Since IDDS highly values co-creation with users, much of IDDS's design process is geared towards being inclusive. IDDS teaches systematic methods to help novices learn design. Each IDDS design team is also assigned a design facilitator, who has experience with design and guides the team through the design process.

IDDS tries to select projects that are relevant for the partner community that is hosting the project. Whenever possible, a community member is included as a core member of the design team, and can contribute insights from his or her personal experience. When conducting research in partner communities, IDDS teams are not just focusing on the projects, but are also trying to build relationships with community members. IDDS teams typically choose to prototype with readily available materials and simple fabrication processes (e.g., hand tools or welding) in order to facilitate co-creation with users and local workshops. Implementation is dependent upon participants, community members, or partner organizations disseminating designs through trainings, developing products, or launching social enterprises.

In the following sections, first, I present IDEO.org's and IDDS's respective philosophies about user participation in the design process. Second, I provide an overview of how IDEO.org and IDDS select projects. Although IDEO.org and IDDS do not consider project selection part of the design process and design teams might not engage in project selection, project selection could heavily influence the likelihood of the organizations achieving their missions. Then, I present illustrative examples of activities and methods used in the Understanding, Ideation and

Prototyping, and Implementation phases of IDEO.org's and IDDS's design processes to highlight some nuanced differences (see Table 6.1 for a summary). My analysis suggests that HCD is not a static standardized process, but one that is readily adapted to organizational context and project context. I also included descriptions of IDEO.org's and IDDS's Problem Framing, and Synthesis and Reframing activities. Although these activities strongly influence the trajectory of projects and the scope of solutions explored by the team, some design teams do not engage in these activities and IDEO.org and IDDS do not include them as core phases in the design process.

Table 6.1. Comparison of the general design process of IDEO.org and IDDS

	IDEO.org	IDDS
Understanding	• Expert interviews with contacts from IDEO and IDEO.org's professional network • Review of exemplary projects in IDEO's proprietary database • Observations or interviews	• Personal experience of users on the design team • Guidance from design facilitators, who are experienced designers • Observations or interviews • Participation in daily activities during multi-day stays in partner community
Ideation and Prototyping	• Ideas are brainstormed using sticky notes, often with sketches • Concepts are selected through design review with IDEO.org or IDEO Creative Directors or Senior Designers • Prototypes of products may be 3D printed, machined models, or computer renderings • Prototypes of service may be story boards, financial analyses, or interactive role plays	• Ideas are generated through discussion amongst team members • Concepts are selected using Pugh Chart analysis with technical metrics and experiments • Design review with other IDDS teams and design facilitators • Looks-like or works-like prototypes are made with hand tools, basic power tools, and welders. Often, prototypes are made in collaboration with local workshops.
Implementation	• IDEO.org teams present slide decks to convey insights and opportunities, and may also create renderings or physical models of concepts • Teams also create plans for launching pilots or scaling up • Partner organizations launch pilots or scale up	• IDDS teams demonstrate an early stage prototype or proof-of-concept of an appropriate technology at a community event. • IDDS supports participants, community members, and partner organizations in disseminating designs through trainings, developing products, or launching social enterprises

6.2 User Participation in HCD

Some designers and development practitioners assume that full participation by users is ideal (Arnstein, 1969; Caruso & Frankel, 2010). However, this research suggests that the organization's participation philosophy and project goals determine when and how to involve users. In the following sections, I describe the participatory philosophies of IDEO.org and IDDS, and their respective influence on the participation of users in the design process.

The Director of IDDS presents three modes of participation in design:

> In HCD, the designer puts a lot of effort in understanding the user, gaining user empathy, getting information from the user, and spending time understanding user needs so that they can create a good design for that user, but the design is separate from the user. In co-creation, the user and the designer come together and create together. They are equal players in the design process and they are engaged together through the entire process. HCD focuses on the user in terms of analyzing the problem and getting feedback on the solution from the user, but not necessarily the creation of the solution. User-created design is where the designer and user are the same. Here, we are building the capacity of the users to become

designers. HCD is design *for*, co-creation is design *with*, and user-created is design *by*. — Amy Smith, Director of IDDS (Smith, 2015a, emphasis added)

Although the Director of IDDS defines HCD according to the level of user participation, the characteristic that predominantly distinguishes HCD from other types of design is the prioritization of user needs in guiding design decisions. Thus, "design for," "design with," and "design by" can all be considered HCD if design teams are prioritizing user needs. Where a design project falls upon the spectrum of user participation is determined by which stakeholders have decision-making power in the creative process. In the following sections, I will refer to "design for*"* users as expert-led design, "design with" users as co-creation, and "design by" users as user-created design. (See Section 7.6.2 for a more nuanced exploration of the participation of various stakeholders in the design process.)

6.2.1 IDEO.org's Participation Philosophy

According to IDEO.org staff, using HCD to ensure that solutions are based on user needs is especially important in the social sector where funders rather than users decide which programs are implemented:

> In the social sector, you have funders and beneficiaries. Frequently, you find donor-driven programs and solutions that aren't based on the real-world needs of actual users, or the communities that are supposed to be benefitted. Human-centered design is an effective tool that designs programs and solutions based on real user needs. — Sean Hewens, Knowledge Manager at IDEO.org (as quoted in United Methodist Communications, 2013)

> There are a lot of missing feedback loops in social sector implementations. The private sector has a feedback loop, although it may be one-dimensional: "Do people buy a product, yes or no?" But in international development, you have projects being implemented thousands of miles away from where decisions are made. Frequently, there's no feedback loop so it's hard to say: "Is it working, and are people choosing to use this?" In these instances, you have programs that are not at all sustainable and not having real impact, and yet donors continue to think they're successful and promote them just because they have been implemented. Human-centered design helps give voice to the community, and ensures design is built around user needs and is sustainable. — Danny Alexander, Senior Designer at IDEO.org (as quoted in United Methodist Communications, 2013)

Ensuring that designs are based on user needs is possible without including users on the design team. Some might argue that expert-led design or the "design for" process is more efficient since significant time and resources are typically required for capacity building to enable co-creation or user-created design.

IDEO.org primarily "designs for" users, but might also occasionally "design with" users. For IDEO.org, the needs of their implementation partners and users guide design decisions, but they are generally not part of the core design team. IDEO.org's design teams are typically composed of professional designers creating solutions for users. IDEO.org strives to be strategic in deciding how and when to involve stakeholders:

> There are moments where we need to move really quickly and that may be just simply coming up with the graphic design of something, and if we were trying to include somebody who didn't have any idea what graphic design principles were, that would totally slow us down. We have been more strategic, not to be exclusive. We're very inclusive in the process when we're gathering information and making sure it's resonating with the community we're trying to serve. But I think in actually executing some of the pieces, because we're on such a tight timeline, that's not always possible. — IDEO.org Staff (S16)

For a project designing a brand for a dignified sanitation service, an IDEO.org design team interviewed employees and users to understand what emotional meaning was associated with the service. Since marketing and graphic design are beyond the skill set of an average person, teaching these skills to enable full participation would have required additional resources. In this project, users were appropriately consulted, and the users' values of reliability, comfort, and pride became core service principles even though users were not members of the design team (Lidgus, 2012).

IDEO.org's Creative Director uses the term "humble experts" to describe the role of designers in the social sector:

> I have the words humble experts up here because I think this is a really fine line that designers have to balance. When we're working in contexts that are so different than our own. And the first is that humility is incredibly important, right? You will not be the expert in this space, you know. You have to learn along with the community. And you have to design with them. But at the same time, […] sprinkle that magic pixie dust. There is value in the reason why you're there. And there's an audacity, a boldness and ability to take things to new places that designers bring and can give to these challenges. — Patrice Martin, IDEO.org's Creative Director (Martin, 2012)

The following quote from a former IDEO.org Project Lead implies that designers are trained to believe that they should seek inspiration from people, but that designers ultimately have the creative power:

> We're designers and as designers we're trained to use the environment and research and people as inspiration and then for us to be the people that distill and give birth to ideas and solutions. To me, that's why a lot of time I don't particularly enjoy co-creation in its purest form. I'd much rather test the prototype and discuss and sure, build and evolve together with people, but in a much more controlled way. […]
> The role of designers […] is interpreting, internalizing, and creating solutions that are based on the context, the users that they're trying to serve. I think a lot of times, designers are able to inform their gut in a way that they can rely on it to make the right decisions at the right time. It's very much [an] intuitive, emotive, rational mix of things. — Former IDEO.org Project Lead (S21)

Designers are also presented as having "an intuition that non-designers do not":

> In the design decision-making process, there's a very clear divide between designers and others. It's presented that designers have an intuition that non-designers do not. Though, we just want to participate also. — Former IDEO.org Fellow (as quoted in Murgatroyd & Whitty, 2014)

According to a former IDEO.org Fellow the user is not a designer, and cannot be expected to co-design, but designers can leverage the expertise of users to develop solutions that meet their needs (S17):

> The thing is that this idea of who has expertise and what level does that expertise participate in the design… The problem a lot of times when we talk about how do we include users into the process, we say, "Let's let them be co-designers," as if they have the same design expertise. And so we don't plug them in, in a way that actually leverages the true expertise that they have. […]
> They're not designers. I've been on many social impact projects where it's like, "Let's give it to the people, and they'll put it together." There are contexts where that can work, but I think there are a lot of contexts where they [the users] are like, "I don't know," and they're putting things together. But if I were to sit there and say, "Tell me about getting water here," or "Tell me about being a farmer in this community," they could spend hours talking about that in a way I would never know, but I can take that data and be able to figure out how to design around it. […]

> My biggest thing is how do you include the user smartly? As a designer, that's something we have the power to figure out how to do. Sometimes it gets broken down to these very base, black and white things. Either the community is involved or they're not involved, and actually I think it's far more nuanced than that. It's one of things that is incumbent on us as a designer is figuring out what is the best way to include users that truly harnesses what their expertise is. — Former IDEO.org Fellow (S17)

Conducting interviews with users is a level of participation that enables them to contribute their "expertise of living within that community," and provides the opportunity to reframe the problem (S17):

> The process of going through and doing these interviews with end-users actually does include them in a pretty interesting way because it is extracting what their expertise is, which is the expertise of living within that community. — Former IDEO.org Fellow (S17)

> The problem framing…The way the interview process is set up actually does allow the user, not necessarily to say, "Tell us what you think the problem is," but this idea of extrapolation of what they're saying to actually… And opening up the space so if you're actually listening to what they're saying, it could be that you realize that the problem you're asking is actually entirely the wrong problem. […]
> That was the same thing with [an IDEO.org] project that I was on. It was the same thing. This is what the client thought the problem was. When we listened to people, we actually found that the problem was an entirely different thing. We reframed our project to address what we felt the users had told to us was the problem. So I think there's a big thing there. — Former IDEO.org Fellow (S17)

The appropriate way to involve users and the appropriate level of participation in ideation varies from project to project (S17):

> In terms of the ideation and the concepting, it varies from project to project. There are possibilities of it but again, it's the same thing, of understanding the community you're engaging with and how you are really assessing where their expertise lies and where their best interests are in coming up with things. — Former IDEO.org Fellow (S17)

Gathering feedback during the prototyping process is also a form of participation (S17). When asked to describe the ideal interaction between designers and users, a former IDEO.org Project Lead noted that users provide an important reality check for designers:

> I think frequent [interactions with the user is ideal]. The shorter the design, prototype, test cycle is, the more you get, the better the output is. […] We'd like to have user testing every week. It's a constant interfacing with the real world. Ultimately, it's very easy for designers to get sidetracked in their own world and have their ego, their point of view obfuscate the right solutions. People ultimately offer up that realistic point of view. […] Digital interaction and usability is this crazy thing where you think it's really simple and dumb and so obvious, and then you give it to somebody and ask them, "Do this; do that," and you see them stumbling and fumbling, and it's a powerful wake up call. — Former IDEO.org Project Lead (S21)

Users might not contribute creative ideas directly, but by telling designers what they want and need, designers can interpret the needs and develop solutions that users may not have dreamed of themselves (S17). Especially in working with low-resource communities, people may be accustomed to not expecting very much, so the role of designers is to facilitate a discussion that reveals the bigger dreams that express unmet needs (S17):

> I've got a project […] where we could easily go and say, "Hey community, tell us what you want us to put on the site next." We started originally an entirely faulty process because what we found is people would give us very pedantic answers that fit with what they knew. Because it's this community that has

been under assault, it was really hard for them to go beyond this box of what they had predetermined as things that would be possible to put in this area. And so one of the things that we had to do through our process of engagement is figure out a way to get them to dream bigger or figure out a way to ask questions differently that would get at the heart of what they really wanted and allow us to help break that box for them.

We put out a circus there for the summer. There's no way the community would've ever told us, "Yeah, what you should be putting on the site is a circus or petting zoo." Or any of the crazy, goofy stuff that we have done, or a StoryCorps booth. We listened to what they said in the interviews and in our other relations with them and pulled from that. The essence of what you're asking is a place where the stories of the community are able to be preserved. We broke a box and said, "Hey, StoryCorps, will you work with us if we build you a booth on site?" We wanted a place where kids could have fun and where we can be together with their families. "Ok, let's bring a circus out here or a petting zoo out here." I think it goes back to what I was saying in terms of how you are combining their expertise in an interesting way. Somebody can say that them saying things around fun and kids was a process of ideation but it wasn't them saying put this here or design this site to accommodate this specific thing. — Former IDEO.org Fellow (S17)

Designers might also ask community members to dream big, distill the essence of what needs are represented by those dreams, and then design something within the budget and constraints of the project (S17):

I use a lot in my lectures a Henry Ford quote […], "If I asked people what they wanted, they would've said a faster horse." How do you tap into this thing? It seems that's the skill we have as designers. We don't leverage it nearly as much as we should but if we hear correctly people say a lot of things that they want but they can't say it in that bigger, broader way. Our ability to see and vision the possibilities allows us to take that and give them what they want.

It could work vice versa because I also find if it's just their project, we basically ask people to dream big not because we have an unlimited budget or no constraints whatsoever, but if you tell me what you think we can build to the budget then we get something that's not really that great. But if you tell something you actually want or desire, like "What's your vision for the future? What's your vision for the kids?" I can look into that, find the thing that's at the essence of that, and then look at my budget and figure out what can I give you that hits at that. It would be far better than if you just named something because you're feeling, "Ok, this is the most I can expect out of this situation because we've never gotten much before so I don't dream big because that stuff never happens here." It's leveraging how design operates as a tool in a different way. — Former IDEO.org Fellow (S17)

The designer is an intermediary between the client and the users (S17).

From the very beginning, the client is also a stakeholder. There's an element of interviewing them in a sense to figure out: What are their needs? What are their desires? How do you design something that fits within that? […] What are coming from our client are the budget and other constraints around liability, etc. And so that's something that we're always keeping in mind. But also with that same project, the data that we pulled from the interviews with the community from the prototyping process— Essentially we're packaging that and sharing it with the client in a way that's also building confidence in their ability to come along [with us] and reframe how they're thinking about the problem. […]

Because you are taking the voices of the people on the ground and communicating it to the client who in some respects has a lot of power because they're dictating what happens in terms of the investments. And so, how do you leverage what you heard from the community in a way that touches what the client needs or is willing to do or will respond to? In some cases, this essentially means that you need to make some amount of compromise that is made because you can't do a direct line, like "Alright, the community wants this or needs this. You guys should fund this." Because whether it's a foundation or a business, they have very pragmatic concerns.

Again, it's this idea that the designer is an intermediary, harnessing this stuff you're getting from the ground, looking at what the client has in terms of their needs and desires, and packaging something that gives the best bang for the buck for the client but also helps the community in a meaningful way. That in

itself is the design project. How do you make something that makes impact given the constraints you're getting from above? Where is the wiggle room to be able to push your client past where they might have originally started? — Former IDEO.org Fellow (S17)

In short, IDEO.org's engagement of users is primarily through interviews to capture user needs or through interactions to test prototypes as solutions are being developed. Users are not generally engaged in the process of generating the concepts or solutions themselves. These are the primary characteristics of what I refer to as expert-led design.

6.2.2 IDDS's Participation Philosophy

IDDS's Director explains the IDDS philosophy that drives its engagement of users by relating the use and creation of technology relative to Maslow's hierarchy of needs (see Figure 6.1):

> The basic needs are very much satisfied by *using* technology, but the higher level needs (I feel) are satisfied by *creating* technology. When we make technologies we feel pride, joy, and a sense of accomplishment. We feel in control of our lives a little bit more because we can create things that we can use to improve our lives or enjoy ourselves or to help the lives of other people. If we want to look at what people need to have a rich and fulfilled life, it is not just water, sanitation, etc., it is really the feeling that we get from creating technologies, not just the functions we get from using technologies.
>
> This is fundamental to the way we do IDDS because we are trying to share that joy of creativity with a very diverse set of people. This is fundamental to the way we do IDDS. If we do not facilitate design in a way that people in the group feel like they have created it themselves, then we are not doing it right. If we do the design for people, we miss out on the higher level needs being satisfied. So for the design facilitation and instruction, it is important to keep in mind how we are teaching design. The creation of design is equally important as the designs themselves. — Amy Smith, Director of IDDS (Smith, 2015a)
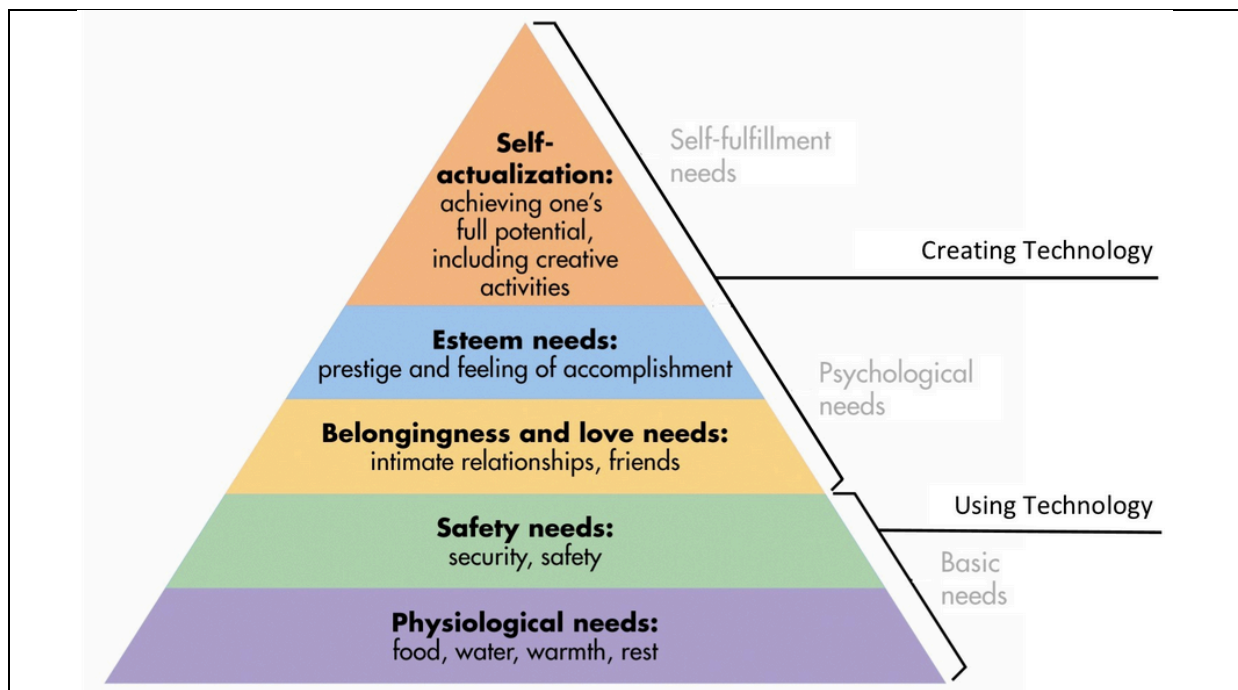

Figure 6.1. IDDS's philosophy explained by mapping technology onto Maslow's Hierarchy of Needs (Smith, 2015h, p. 4)

Based on these philosophical underpinnings, IDDS posits that co-creation is critical for long-term sustainable development:

> We believe very strongly in the idea of co-creation: the concept that it is better to provide communities with the skills and tools to become innovators and develop new technologies themselves rather than to simply providing the technologies. We believe that developing the capacity for innovation and creativity is critical for long-term sustainable improvements in the quality of life in a community. — (IDDS, 2013)

IDDS teams strive for co-creation during IDDS conferences. However, the Director of IDDS also acknowledges that each mode of participation has a place in design, and that design projects might transition through more than one mode at various times:

> There is design *for*, *with* and *by* people living in poverty. Honestly, there are places for all three of those. One is not more important than the other. Throughout all of them, we want to be inclusive in order to make things accessible, affordable, and applicable. These design principles are good things to keep in mind for guidance for moving forward. Another thing (which I think is essential) is, as you are working through the design process, think of which of these design principles are the right ones to be engaging in. Should we be engaging in co-creation *with* people, or building capacity to promote design *by* people, or some combination of the two? Or is this something that should be done in a research lab where there are more facilities and it's designing *for*? These are all aspects of design that are pretty important. The true challenge is understanding which is the appropriate method in which situation. — Amy Smith, Director of IDDS (Smith, 2015a, emphasis added)

> Things flow back and forth. You might do creative capacity building where you are empowering people to design, but you are doing that in a way of setting a stage so that you are doing co-creation in a meaningful way because people aren't comfortable with design. They can feed into each other. — Amy Smith, Director of IDDS (Smith, 2015a)

> We do not want to imply that one design method is better than another. It is not that you are always working towards design by people in the community. There are people going to be working in research labs around the world for people in the developing world, and we want them to do a good job at that. We want them to use effective design tools to make great technologies for people living in the developing world. To us educators, that is a lot of what our students do because they are at a distance. For that, it is important to understand that it is not a value judgment. Most projects have a degree of each of those design methods in them. There are certain contexts in which we can use certain approaches and that we should consider all of them effective tools in creating cultures for innovation whether they be within or outside of a community or when those two meet and it is co-creation. It is not an evolution where it starts from *for*, then *with*, and finally *by*. All three of them are legitimate approaches. Each of them has situations in which they are most appropriate. We have a certain degree of each of those happening in IDDS. Different ones are appropriate in different conditions. — Amy Smith, Director of IDDS (Smith, 2015a)

IDDS guides design teams through the process of identifying which stakeholders to engage, and planning how and when in the design process to engage them. Yet, the Director of IDDS also recognizes that, "Realistically, you can't engage everyone as thoroughly as you like in every stage [of the design process]. In some cases it is not appropriate, and in some cases you just don't have the time to manage it" (Smith, 2015b). There are situations in which participation is not feasible, beneficial, or wanted. In reflecting upon his experiences conducting a Creative-Capacity Building workshop, Kofi Taha acknowledged that "some people just prefer to buy their technologies and have no interest in making them" (Taha, 2011, p. 41):

> In terms of inclusiveness, I now realize that I expected carving out a welcoming space for women in our trainings to be the key hurdle, when in fact, it was unclear to me how many women wanted to use tools or

participate in the technology design. While there were many women who enthusiastically participated and embraced the opportunity to learn how to use new tools with confidence, there were some who simply did not want to, and it didn't appear to be about taboos; some women seemed to be saying that they didn't want to have to add making technology to their already long list of responsibilities. It was about choice, and it was affected more by individual personality and circumstance than by our efforts to be inclusive. — (Taha, 2011 p. 41)

The belief that people who engage in building the technologies they use will be more self-fulfilled has driven IDDS to adopt a very different mode of interaction with users, as often as possible engaging them throughout the steps of the design process. This places them squarely in the co-creation mode, and sometimes in the user-created mode of design, which is quite different than that expert-led mode of IDEO.org.

6.3 Project or Partner Selection

"Project selection is the most important and most challenging part of the design process" (Smith, 2015d). Projects are the primary way through which IDEO.org achieves social impact. Projects are the primary way through which IDDS transforms participants into social innovators:

> [An IDDS is] a special event at a moment in time. We have people once. It is not a continuous program where people keep coming over several years. That happens with project continuity and the network, not the summits. The summit is a moment to achieve something amazing. The way we achieve that is through the projects. Projects are perhaps the single most important (after community members, after stakeholders). You can have a summit with just people living in poverty engaged in development projects. — Benjamin Linder, IDDS Faculty Member (Linder, 2015a)

6.3.1 IDEO.org's Partner Selection

IDEO.org partners with "nonprofit organizations, social enterprises, and foundations to directly address the needs of the poor" (IDEO.org, 2014a). By selecting partner organizations, IDEO.org is also essentially selecting projects because the partner organizations tend to already have a sense of what problem they want to address. IDEO.org ensures that it is selecting impactful projects through its mission to target low-income populations and also through strategic partnerships (S18):

> First of all, all of our work revolves around low-income and vulnerable populations of people. So our partners have to be working with those core groups in a way that's not just an intermediary, but have that presence in the field or a deep partnership with someone in the field. (The field can obviously be the U.S. [United States] or anywhere, but just the field where the work is happening.)
>
> It's through strategic partnerships that we know what we're researching and working on matters and is impactful, through the mission, and then separately, the second one is through strategic partnerships. So for example, we do get calls from people who are doing interesting things or talking about a challenge that we've seen ourselves in some of our other work and are interested in working on, but they might not actually have a presence on the ground, in the community, which they're working in. Or they might not actually have people on their team, that are working for this issue that either have deep experience in the sector or are from the community which they're trying to serve. — IDEO.org Staff (S18)

IDEO.org has learned from experience that it is critical to partner with organizations that work directly with end users or have deep experience in the project sector, so that recommendations can be directly implemented:

> If [IDEO.org] were ever working for big corporations or foundations, part of the stipulation of the project ended up being that they would have a local group that they were working with. So it wasn't that the data got taken back up to the larger group (who may or may not have the facility to deal with how to apply it in a local context), but that there was some local group who did still benefit regardless of whether what was happening with the larger group. I think that based on experiences that happened in our [first Fellowship] year means that there's more localized impact and inclusion. — Former IDEO.org Fellow (S17)

IDEO.org assesses partnerships based largely upon the potential benefit of the partnership to users, and also considers secondary factors, such as partner reputation, legacy, program size, location, and impact (S18):

> We're mission-driven and I think our mission is though vague (vague probably to others), I think it really does constrain some of the conversations that we have. So like, "How are we designing for the low-income target population that you (X organization) are serving?" And less about you as the organization, like "How is our partnership actually going to lend benefit to the individual on the individual level? And then secondly, through being selective and thoughtful about the partnerships that we enter in, based on everything from partner reputation to legacy to program size to region to location to how many programs they have in the field to their impact. So we look at that too. Especially now, as we've grown a lot over the past three years, we look deeply into those things before agreeing to partner. — IDEO.org Staff (S18)

Rather than developing a rigorous framework to assess partners, IDEO.org's partnership selection process is intentionally driven by the intuition and experience of IDEO.org's partnership team (S18):

> [Partnership selection] is not super rigorous, and I hope it doesn't get super rigorous because there's an element of it that I think can't be quantified, and it probably shouldn't be quantified. There are a lot of really impactful organizations out there that have reached out to us that in some sort of framework wouldn't have been that appealing, but we've had a lot of success with. I think it's not too hard to figure out (I think for us) whether or not this partner will be impactful (the work that they're seeking to do with us) through a series of questions. So some of the questions I ask are based on a gut reaction. Because I think over time, especially in a partnerships role (and we're talking to thousands of organizations... so I think whether it's good or bad), I've developed a sense around what I think an impactful partnership looks like, personally. — IDEO.org Staff (S18)

In initial calls with clients, IDEO.org's partnership team asks questions to help assess whether partner organizations have flexibility to be able to adopt a new experimental concept, as well as the commitment and capacity to sustain it (S18):

> We ask them questions about how they're strategically thinking about this project: Is the thing they're approaching us about at the heart of the organization? Is it something more experimental for them? How they think about making that thing, whether that thing is sustainable, and feasible? Are they thinking about it in the long term or are they just looking to throw ideas out there and see what sticks? But not necessarily have a plan for keeping those things going, just keeping that concept alive.
> I mean, we do some research, light research, on their size. It doesn't preclude anything, but gives us a sense of how they're able to absorb a new concept or idea. If it's a two-person nonprofit that's looking to do something experimental, while keeping their main focus, which could be in another area, that group might not be as likely to absorb a design project first of all, and the resulting concepts of that design project.

But most of our partners are the size of which they can devote resources to experiment, or they can evolve their core offering, and we know that they are set up and structured to take it forward.

That's some of the stuff we start to scratch the surface with in these initial calls, but I mean also, a lot of us that are working on partnerships at IDEO.org are coming from different networks and different experiences, and we've founded a nice network. — IDEO.org Staff (S18)

We don't want our concepts to die due to an organization's inability to really dedicate themselves. So I think that first question that I mentioned, of really understanding if the idea or the desire for our collaboration (whatever it revolves around) if it's really close to the heart of the organization. It's easy to see sometimes, because the people, when they approach us, they're like, "Yeah, well we've created a budget for this. We've been working on making this a real collaboration for the last year." And they just didn't know at that time that we [IDEO.org] would be the partner. Or they have dedicated staff to working on a particular project. I think it's easy, it can be easy to see them committing to an idea long before we're even at the table, which is always good because you start to feel that passion to take things forward, from them. — IDEO.org Staff (S18)

When assessing partnerships, IDEO.org heavily considers what measurable impact is achievable through the partnership (S18):

That's one of those questions that is added to the list I started with when I talk to partners: How are we going to quantify our success together? What does success look like? Basically that's something that we ask them and the design team asks them in kickoff meetings so that we're all aligned and understand their vision of what success is. [...]

An example of MSI [Marie Stopes International] work, we were like, "What does impact look like for you?" And it's like 100,000 young people using long-acting contraceptives in Kenya, and their program is huge. [...] They came to the table and they were like, " We think this is achievable for these reasons," and that's what they're measuring. So our concepts that we're ultimately developing are in service of this goal, which is to touch the lives of 100,000 people through offering long-term contraceptive care. [...]

[Measurable impact is] a huge thing that we look for because that helps us understand as an organization if we're having impact on the [partner] organization and if we're achieving our goals. Without measurable impact, it's much harder to know. — IDEO.org Staff (S18)

If a partnership is unlikely to yield measurable impact, IDEO.org may provide some training in HCD to prepare for a partnership with that organization in the future, or they might refer the organization to other design firms that might be better partners for them at the moment (S18):

And sometimes, we're on the fence about a partnership for a variety of reasons. Maybe the timeline's not right or we need to do more fundraising together, or it's maybe not something we can do in the next six months. We frequently come back to the question of what is the measurable impact of this partnership going to be. And if we really feel strongly in their capacity to implement, to absorb design thinking and really evolve that in their organizations, and whatever the opportunity is will lead to measurable impact, [...] we dedicate ourselves to it.

But if we can't answer that strongly, it guides how our partnership looks like with them, in terms of maybe we just do some methodology work with them right now, and then get them up to speed, and then hope to partner together in a longer term, maybe for next year. Or maybe we're not the right partners for you in this moment, but we know somebody who is. So we've developed this whole referral list of design teams out there in the world that can potentially collaborate with you. — IDEO.org Staff (S18)

In addition, IDEO.org intentionally selects client or partner organizations that are open to the design process:

For identifying the right partners, we need people who are open to the messiness of our project, which is hard to articulate. But we do have to do quite a bit of work to onboard people to what human-centered

design is and what the value of it is. So if people aren't a little bit mavericks or renegades in their sector, then it may not be a great fit because what we're doing and what we're offering is to dramatically change the way that you approach your user or customer, whoever it is you're trying to serve. And that can be really difficult or scary for people. — IDEO.org Staff (S16)

The last remaining bucket […] is their willingness to basically try something new. A lot of our partners are big implementers or big funders or have a deep and technical expertise (in agriculture or child and maternal health, I'm just throwing out examples to add some color to it), and with the deep level of expertise comes certain methodologies that people are very attached to. And some of them are more academic and some of them come from technical backgrounds, like engineering. People are steeped in what they know and so it's really exciting to come into partnerships with groups that are really excited to learn a new methodology and get their hands dirty and be open, come to the table open to what design thinking can do for them, and are excited to like bring their staff into that and basically have this new tool in their toolbox to use for future challenges themselves. […]

We always want to be working with someone who is receptive to us and want to try something new and are okay at points where it can be uncomfortable and they feel really out of their element, but they're still excited. […]

Especially people in the health field – very rigorous, very quantitatively driven, which is wonderful, and that's why they are a perfect partner for someone like us, that's a little bit more on the qualitative side and has obviously a heavy creative and design bias, so a match made in heaven. — IDEO.org Staff (S18)

Moreover, IDEO.org has moved beyond vetting partners that seek collaboration with IDEO.org, towards being strategic about proactively selecting partners that IDEO.org can meaningfully support (S18):

And we're also at a point now, and have been since late last year [2014], reverse seeking out partners. We've watched certain partners do really cool things and think, "Well, we can actually help them," if we have an idea for how we can support them. And actually being in a position that's seeking out strategic and meaningful partnerships rather than vetting them, which is nice as well. — IDEO.org Staff (S18)

IDEO.org conveys the value proposition of HCD to their partners by emphasizing how qualitative data can complement quantitative data, and how their approach to research takes into consideration the user as well as the systems that influence the user (S18). One of the best ways to build credibility is to show that HCD can uncover information that is surprising to sector experts, and people who have used other methodologies (S18):

We [at IDEO.org] convey our value in HCD in a few ways. First, I think we're hugely complementary to heavily quantitative groups. […] A lot of our partners are implementers, and do bring that more quantitative feel and bias. So I think they recognize in us that the qualitative has a big role to play. And actually going and spending time with their target groups, which some of them who reach out to us, or especially at the partnerships level, never have. Some of them have maybe not spent a lot of time with the people that their organization is serving, and lots of them very much have. […]

In the example of MSI [Marie Stopes International], we had a deep relationship with them, but we started working with a new program in Kenya, Marie Stopes Kenya. We had to bring them up to speed on the methodology and basically say, "Our value to you is to get you a really deep understanding of the young people who are not coming into your clinics, and we believe we can do that better than anyone else, because we don't just look at the youth. We don't just look at the teenage girl. (We spend the vast majority of the time working with her.) We're also spending a lot of time working in the community or ecosystem in which she exists, which is influencing her decisions hugely."

I think sometimes, at that point, partners are like, "Ok, well yeah, I believe you, but I could also send a team of researchers out to do it, and they would find the same information." But when we come back with that information, nine point nine times out of ten […], when we shared all of our insights, they're surprised — these are people who work in this field. Because I do think that the methodology, especially once we

start getting into prototyping, which is very different from anything that our partners generally experience or learn themselves. I think that we do surface insights through this approach that they aren't surfacing themselves. So when we bring them back to them, I think that validates our value after the research phase in a way that's pretty interesting and it allows us to co-design really creative and cool prototypes together to dig even deeper. […] It's always such a rewarding moment when we go back to partners with the insights that we've gathered, and they themselves are surprised by what they're hearing, in both the positive and the negative sense. We're either highlighting a barrier that they didn't know existed, or we're bringing to the front an opportunity area that they didn't know existed. — IDEO.org Staff (S18)

IDEO.org also gains credibility by referring to successful projects in IDEO's portfolio, and IDEO.org's own growing portfolio:

How I talk about our value really depends partner to partner, but I believe in what we're doing, and some of that comes out in the calls, like my personal belief in being able to get them to where they want to go. And I usually set examples of answers to their questions from our former work. I also think being part of the IDEO family, people have some understanding of what IDEO has delivered as a for-profit so their portfolio speaks for itself. And we've done close to sixty design engagements now and are starting to put those impact numbers together. We ourselves are seeing our value, and working toward being able to talk about our value from a place of impact too. — IDEO.org Staff (S18)

In short, project selection at IDEO.org is largely done through the selection of the partner organizations with whom IDEO.org wishes to work. They select organizations that they believe can make a measurable impact, often seeking out such partnerships through their own scanning of the social sector and development landscape. IDEO.org's approach to project selection fits well with their choice to employ an expert-led design process. Partner organizations expect an expert design team to uncover groundbreaking insights and develop innovative products, services, and programs with high potential for impact.

6.3.2 IDDS's Project Selection

For IDDS, projects must be authentic development challenges that also serve as vehicles for learning and provide potential for impact:

It is important that the projects are authentic challenges and are real. They are not practice projects, not project lessons. They are really doing development. Development can't be done in a project in twelve weeks or four weeks so the projects have to fit into that moment in time.

Projects enable learning. We are developing people at summits. It is the most important thing. We are transforming people; we are changing who they are. The projects are opportunities for impact, to do real and important good in the world. An opportunity is a long way from actually having impact. They are seeds of possibility. They haven't grown into change.

We can undermine the transformation moment if the participants feel that the project is not going anywhere and does not have the potential for impact. Participants come to summits hoping to make change. They don't entirely realize that they're coming to be transformed. The distinction between learning for transformation and the opportunity for impact is a vital one. We've learned how to balance and negotiate this tension. — Benjamin Linder, IDDS Faculty Member (Linder, 2015a)

The ideas for IDDS projects originate from a variety of different sources, such as IDDS organizers, IDDS participants, partner communities, past IDDS projects, related programs, and development organizations (Linder, 2015b, p. 4). One possible process for identifying and selecting projects is as follows: "research potential challenges, engage with stakeholders/communities, collect many project ideas, verify with communities and resources,

narrow to a workable [problem frame], have participants vote […], form teams based on preferences, engage teams with additional info after [team formation]" (Linder, 2015b, p. 4). IDDS projects must align with the other key elements of an IDDS conference, and therefore must satisfy the following criteria (Linder, 2015b, p. 3, emphasis added):

- Address a real challenge in the local *context*,
- Be meaningful and doable with *community members*,
- Excite *participants*,
- Fit with the stages and content of the *curriculum*,
- Be workable in the *time* available
- Fit the experience and skills of *design facilitators*, and
- Represent the IDDS *spirit* (see Section 5.4.2 IDDS's culture for more details) by recognizing the dignity of all people creating together for change.

Since IDDS is essentially an educational conference, the list of potential projects are assessed as a portfolio that overall will satisfy all the requirements of the conference. For example, IDDS participants tend to have some preconceived preferences for what types of projects they would like to engage in at IDDS. The portfolio must offer enough diversity to enable each participant to satisfy their needs; otherwise, some participants will feel unmotivated and IDDS's ultimate goal of personal transformation would be jeopardized (Linder, 2015a). Since IDDS believes in co-creation, the project portfolio should align with the communities' interest and capacity to participate (Linder, 2015a). The projects in the portfolio should also be similarly scoped to enable project teams to progress through the curriculum at a similar pace (Linder, 2015a).

In addition to assessing projects as a portfolio, IDDS also assesses each project based on a set of twelve criteria that have grounding in IDDS's mission, strategy for creating and empowering social innovators, and participation philosophy (Linder, 2015b, p. 5):

1. Does it address a significant development issue? Some challenges may be interesting from a design or education perspective, but may feel inappropriate if there are more compelling or urgent needs in the community.
2. Is it a verified need for people living in poverty? There may be easier or other interesting challenges serving higher income populations, but IDDS is dedicated to addressing issues of poverty.
3. Is it a hands-on design challenge? IDDS's theory about personal transformation hinges upon experiential learning.
4. Does it provide opportunity for rapid prototyping and testing? Teams will be demoralized if they cannot make or test prototypes.
5. Is there room for technical and business innovation? IDDS's mission is creative capacity building with relation to technology and entrepreneurship.
6. Is it an open-ended challenge, with many possible solutions?
7. Is there potential for project continuity and ownership?
8. Is there potential for viability and scale?
9. Can tangible progress be made at the summit? Teams must be able to realize some level of success to achieve IDDS's ultimate goal of personal transformation.
10. Are local resources available to develop it?

11. Is the organizing team confident that the project will go well? Sometimes, it is hard to identify why a project does not seem like a good idea, but it is important to trust the intuition of the organizing team.
12. Are there strong advocates without a conflict of interest? Strong advocates must be open to letting teams find their own direction and have ownership of the project. Autonomy is a critical component of in IDDS's strategy for creating a transformative design experience.

Considering the broad range of criteria for project selection, it requires significant time, resources, skill and engagement with stakeholders:

> An [IDDS] organizing team can underestimate projects. Given that they are so important to summits, projects are probably about the single hardest thing to do about running a summit. That takes time, tension, and careful thought, and engagement with people living in poverty, stakeholders, partners, network members, etc. It takes resources to do so. — Benjamin Linder, IDDS Faculty Member (Linder, 2015a)

IDDS's approach to project selection differs radically from IDEO.org's largely due to its educational mission and to its desire to teach users how to design. It focuses on projects that fulfill a need in a local community, that fit with the educational mission of the IDDS summit, that allow for hands-on engagement, and that have sufficient interest from participants at the summit. While IDDS seeks projects, as does IDEO.org, that are scalable and could have significant impact, often the other criteria win out.

6.4 Problem Framing

A design project typically begins with problem framing to define the scope and focus of the design challenge. The problem framing establishes realistic goals with opportunities to explore and discover unexpected and serendipitous solutions. Each problem framing also implies a realm of potential solutions.

6.4.1 IDEO.org's Problem Framing

IDEO.org works with partners to carefully frame a problem in a way that will maximize the impact of the design project for the partner's goals. Although HCD is applicable to all areas, it works best for challenges that focus on deeply understanding the end user (S18):

> Human-centered design is applicable to all challenges or all opportunity areas. There can be a specific type of problem that the methodology lends itself best to work in, in which the partner wants to gain a really deep understanding of who they are targeting and whether that's a patient or a client or youth. — IDEO.org Staff (S18)

An IDEO.org staff member elaborates upon the process of listening to what partner organizations have identified as their core challenges, while also trying to present opportunities that are aligned with their existing work streams and may achieve their goals in a new way (S18):

> [Problem framing is] probably the biggest part of the partnership team's role in IDEO.org and in shepherding partners through the process and the methodology. Because a lot of partners come to us and know what the core challenge is that they're experiencing… And, of course, they're the most knowledgeable, so we obviously listen to that and try to hear in great detail why they think that is the core challenge and what's leading them to make that conclusion about their work and about what they're seeing. But ultimately, what I try to do is navigate partners to think about things a little bit more broadly.
>
> So for example, if someone's approaching us and saying that for example, (I'll use a reproductive health example) […] that they're having a very difficult time in reaching youth through their clinics… One of our partners worked primarily through clinics. Well, what we did in that situation, in the very early conversations is try to help them zoom out of it and think through, "Well, is the clinic experience… Is the clinic channel best served by reaching youth?" […]
>
> Well, it's impossible to be (I think) objective about one's own work, but with the partners, we really try and get them to see the opportunities that are outside of their existing structure or outside of the things that they're trying now that could ultimately achieve the same goal in a new way. At the same time, I think we're really respectful in working with partners through work streams that are in accordance with who they are. We don't want to present an idea and then be like, "Oh, well, you actually need this entire other stream of work or you need this entire other piece of your business to manage." […]
>
> We try to understand what is working for them, if their structure does lend itself well to achieving their goals, and then how to tweak or modify those things if they're not working for them. […] I feel like that piece is especially challenging, because it's hard to know from the beginning, right from your first conversation with a partner or a funder that's meeting with us on behalf of other partners, which parts of their business, or of their structure or of their mission are serving them and which are not. And that comes through […] the research we do, and it's pulling all those pieces apart and analyzing them separately to come up with ideas for them, that are substantiated in the research itself. — IDEO.org Staff (S18)

According to IDEO.org's Design Kit, "properly framed design challenges drive toward ultimate impact, allow for a variety of solutions, and take into account constraints and context" (IDEO.org, 2015b, p. 31). They should be broad enough to inspire creative solutions but narrow enough to give a starting point for idea generation. IDEO.org's approach to problem framing thus focuses on finding appropriate intersections between the problems their partners seek to solve, and their particular expert-led human-centered design expertise.

6.4.2 IDDS's Problem Framing

Problem framing is an art, and there is not necessarily a clear right answer. IDDS has developed some guidelines to highlight the most important elements for problem framing (Linder, 2015b, p. 6):

- The project *scope* should be appropriate for the length of the summit. It should not be as broad as a sector, or as narrow as specifying solutions.
- There should be a personal *story* about real people with a pain or unrealized potential. A personal story helps to motivate participants, and also gives teams a starting point for identifying stakeholders to engage.
- The problem framing should focus on user needs and the *problem*, not solutions.
- The problem framing should be *flexible* enough to enable teams to reframe.
- The *importance* of the project should be supported with evidence indicating the potential for impact. If only a thousand people have that challenge, it will have limited opportunity for scaling, and might not seem compelling compared to other issues.

IDDS organizers do the initial problem framing for projects, but IDDS also guides participants through the process of reframing the problem so they can learn to gain empathy for the user and better understand the context:

> Even if we had the perfect problem framing, we will still want to team to go through a variety of these exercises so that they understand and they could gain empathy and that they understood the context well. The exercises that they do are really important for their own education and for framing the problem. — Amy Smith, Director of IDDS (Smith, 2015b)

IDDS encourages design teams to validate potential problem framings with key stakeholders in the community (Smith, 2015d). In this way, IDDS differs from IDEO.org in that it engages users directly in the process of problem framing, grounded in stories about real people. However, IDDS teams often prioritize meeting the needs of stakeholder engaged during the IDDS conferences, and find it difficult to achieve broader impact and scale:

> [IDDS teams] don't do much market research in the beginning. You just see that individual, and what their need is, so we end up with doing a prototype that's really cheap and that they can use. It's a lot about the replication model [in which users create their own technologies], rather than something that could be scaled up or be turned into business. — IDIN Staff (S1)

6.5 Understanding Phase

In the Understanding Phase, the team gathers information that will improve understanding of the problem and possible solutions. Design teams often capture important themes from user research with sticky notes because the limited size encourages conciseness, and the colors and mobility enable rapid categorization and pattern recognition. Before starting user research in the field, IDEO.org and IDDS design teams typically conduct secondary research online about the users, the context of use, or prior art.

6.5.1 IDEO.org's Understanding Phase

IDEO.org design teams have access to experts through the recognition of the IDEO brand and through IDEO.org's and IDEO's vast professional network of colleagues and clients. IDEO.org teams also receive information and guidance from clients or IDEO designers that have worked on similar projects in the past. In addition, IDEO.org teams have access to IDEO's internal knowledge management system "The Tube," which provides a catalog of exemplary projects and methods.

Since most of IDEO.org's projects focus at the regional or national scale, user research is typically conducted in multiple locations to gain a broader understanding of user needs beyond a single village or neighborhood. Often the design team will create a research plan including a rough schedule, methods (e.g., shadowing or semi-structured interviews), user profiles, and interview questions. The team may also create artifacts, photo prompts, or other props that would help a user imagine a scenario. IDEO.org's Design Kit (IDEO.org, 2015a; IDEO.org, 2015e) includes methods (e.g., self-documentation through photos) to help users express what may be tacit knowledge, or that which is implicit or inherently understood but difficult to verbalize (Polanyi, 2009).

To gain credibility quickly and facilitate understanding of the local context, IDEO.org works with local partners who serve as translators, cultural guides, and community liaisons (Brown & Wyatt, 2010, p. 33). IDEO.org's local contacts or partners may help organize site visits or user interviews. Sometimes, IDEO.org hires a local market research agency to identify potential users and may also compensate them for their participation. Although local liaisons are

incredibly helpful, a former IDEO.org Project Lead emphasizes that "designers should always directly participate and hear for themselves what users are experiencing or talking about" (S21).

Implementation partners are encouraged to accompany the design team during the user research so they can also hear directly from users. According to a former IDEO.org Project Lead, "[By] having the client participate, they start to internalize the insights for themselves, which is then important for the implementation phase because it fuels them to make things happen, and in making decisions, they'll remember themselves. But also buying into what the designers are coming up with are born out of real people, real needs, real realities, the real context, and not purely out of intuition and creativity" (S21).

A Former IDEO.org Fellow elaborated upon the rigor with which IDEO.org designs interviews, and the benefits of gathering information about the context (e.g., perception of the broader market) in addition to the specific service being designed:

> I always did interviews for projects but I interviewed intuitively based on what seemed right. But the idea that you're applying some rigor into the way in which…you're designing interviews essentially. There's a beginning, a middle, and an end to interviews and there's certain types of questions that you would ask at some point in that process and the ways in which you're asking those questions to get at particular bits of data whether that's looking at their larger life issues as opposed to specific things related to the project or coloring other things that actually influence the thing you're looking at, but aren't actually the thing you're looking at.
>
> Like say with SmartLife [a business to sell water alongside nutrition and hygiene products], it's understanding the way people view things within the generalized marketplace and perception of things like forgery and counterfeit goods. Understanding that was actually really crucial to things that folded in to the business model both on the product side and the water side but that's not something traditionally you would've thought to ask if you were just doing a project around water and products. You would've had more questions like, "How I should price it?" or "What kinds of products would I like to see?" So this idea of asking different and broader question to get at the things that relate to your specific question is something I pulled out of the Fellowship experience. — Former IDEO.org Fellow (S17)

An IDEO.org staff member notes how IDEO.org's approach to HCD emphasizes the importance of understanding the needs of the individual, as well as the dynamics of individuals, families, communities, and ecosystems:

> Human-centered design really starts from a place of gaining deep empathy for the person that you're trying to serve and you're trying to design for. I'm looking at all of the components of their lives, so everything from what they're saying and telling us what they're thinking, to what's it like to live in their communities, what's it like to exist in their family structures, what's it like in their school system, and so on and so forth. We try to understand both the individual, but also obviously pay a lot of focus to the communities that those individuals, and ecosystems in which those individuals are existing in. — IDEO.org Staff (S18)

The Understand Phase of the HCD process requires developing deep understanding of users. IDEO.org gains this understanding through in-depth interviews and observations of users in the context of use, sometimes leveraging local partnerships to gain access.

6.5.2 IDDS's Understanding Phase

IDDS teams conduct secondary research by searching the Internet for prior art and competing technologies, or technical information relevant for the project. However, Internet connectivity is often slow or unreliable at IDDS sites in emerging regions. IDDS teams may also

seek guidance and technical advice from IDDS design facilitators, who are typically experienced designers, engineers, or inventors.

Moreover, IDDS tries to maximize the participation of stakeholders in the design process. IDDS emphasizes the importance of co-creation and introduces participants to tools that will help them to identify stakeholders affected by the project and to plan ways to involve them in the design process. IDDS teams conduct observations and interviews with stakeholders during field visits. IDDS teams live in the communities they work in for multiple days and often participate in daily activities with key stakeholders. There is a rapport and trust that develops during this time that is difficult to reproduce in a short interview setting. Community members from the locales where IDDS works are also encouraged to participate in IDDS, and serve as cultural guides and liaisons to the community. Volunteer translators enable community members on the design team to fully engage in the design process. It is important to note that although community members can contribute relevant knowledge about the context of use and the intended user, they may not be users themselves. IDDS recognizes that no individual can represent the needs of everyone in his community. Although community members' contextual knowledge and practical expertise are valued, IDDS teaches all participants to question their assumptions and to gather feedback from actual users.

Similarly to IDEO.org, IDDS aims to develop deep understanding of users of the technologies it is developing. In addition to interviews and observation, however, IDDS strives to engages stakeholders in all aspects of the design process and includes users as team members on some projects. Moreover, IDDS immerses its design teams in partner communities and attempts to develop long-term relationships with community members.

6.6 Ideation and Prototyping Phase

During the Ideating and Prototyping Phase, based on the insights generated during the Understand Phase, design teams generate many concepts, prototype to learn, and select the most promising concepts to implement. According to IDEO.org staff members, one of the benefits of practicing HCD in the social sector is prototyping or "mitigating risk by testing early and failing fast":

> The biggest advantage or biggest value is not designing or thinking or architecting in a vacuum. Ultimately, prototyping in the field [...] is about putting your ideas out there early on before you invest a lot of time and energy in. That's fundamental, in general or for a business, but especially for the social sector, which has a history of doing really, really big programs that get designed elsewhere, away from the context, and then get deployed whether they work or not. — Former IDEO.org Project Lead (S21)

> In general, the development community is very risk averse. If things go badly, you're not talking about losing quarterly profits, but losing lives. One of the benefits of human-centered design is to mitigate risk by testing early and failing fast. In the developing world, so often where projects fail, is not around the actual technology or solution, but about how it is implemented in the context of the community. You need to ask yourself: "Even if the technology is good, how it might fail anyway?" For example, is microcredit needed to enable the community to make the necessary purchase? Is training needed to ensure that the technology will be used? You need to figure out all the conditions necessary to the technology being implemented and sustainable. — Sean Hewens, Knowledge Manager at IDEO.org (as quoted in United Methodist Communications, 2013)

An IDEO.org staff member elaborated upon the importance of learning from failure to identify more promising directions for solution:

> Our ethos is not that failure is good or bad, but that when you learn from it, failure can be a very positive part of the process. You want to try to get some of the failing out early so that you can learn from it and let it influence the design of a better more successful project. […] Here's an […] example of "Failure" with a big "F", where folks didn't fail early. In this example, an organization spent a lot of time investing in a large program that was rolled out without ever testing with the community. The program, which was implemented in a refugee camp in northern Kenya [near the border with Somalia], provided a nutritional pack called Sprinkles. The idea was that users would open the vitamin packet and sprinkle it on food or in water to provide basic vitamins for kids. But when the program was implemented, none of the parents would give it to their kids. Why? The foil wrappers that contained the vitamins looked just like condom wrappers. So this program had spent all this money designing and distributing the packets, and then failed. If they had run a small pilot initially, or even prototyped the packaging, they would have failed in a small way earlier in the process, and been able to change the packaging at a much smaller cost. You want to start small, pilot early on and then scale up. This is the value of human-centered design. — Sean Hewens, Knowledge Manager at IDEO.org (as quoted in United Methodist Communications, 2013)

Instead of emphasizing the importance of failure, the Director of IDDS prefers an alternate framing of the design process. Similar to Beckman and Barry's framing of innovation as a learning process (2007), the Director of IDDS frames the design process as an iterative learning cycle of experimenting, learning, and acting:

> There's a lot of talk about failure these days, and expressions like "Fail fast, and fail often." […] My theory is that we don't actually want people to fail. What we've done is taken a word and changed its definition in a way that I have problems with. Because whether it's a prototype, or a business, or a process, or a system, there's always a process that you go through, where you do a small experiment, you learn from it, and then you act on what you learned. This is iteration. We do that in the design process. Ideally, we do that as we're starting up a program. We do a pilot, we learn from it, we do a larger pilot, etc.
> I think when we talk about failure, people speak about it as that design thinking process, and I don't think that's a good way to talk about it. Failure is when you try the exact same thing over and over again, and it still didn't work. Or sometimes, there are things that should have been avoided. But largely, what we do is designing experiments, learning from them, and then acting. That is the correct way to think about the implementation of a program or a project. To call that failure, I think is a wrong thing. You may get positive or negative results, but that's what iteration is. That's what science is. That's just the way things are. […]
> A lot of times, people will think about getting fully successful results in their first try and that is unrealistic. Design thinking brings the idea of experimenting, learning and acting. That is to a certain degree what we want to bring out in the design process. […]
> [Experimenting, learning, and acting] happen when we are designing a problem and building it, and that happens when are building a prototype. It happens when we are developing a product, and it happens when we are creating and scaling a venture. This happens multiple times. You have experiments, then you learn, and you act.
> If we look at the design process in terms of this learning cycle it will help us in our ability to recognize that you don't have to get everything right all the time, you just have to learn from what you do. You want to learn as much as possible every time. So at each step, you want to ask your team if they are learning as much as they can. Or can you do things a little bit different to allow them to learn a lot more? — Amy Smith, Director of IDDS (Smith, 2015b)

Prototyping, iteration, and experimentation are key tenets of HCD regardless of whether they are framed as failure or a learning cycle. In the development sector, where multi-year projects are often evaluated only after the project has been completed, small-scale tests and evaluation during

implementation offers opportunities to address challenges early and avoid costly large-scale mistakes (Sandhu, 2013).

6.6.1 IDEO.org's Ideation and Prototyping Phase

Brainstorming is a popular method for generating many ideas (Osborn, 1953). IDEO.org design teams sometimes invite IDEO.org's and IDEO's Creative Directors, Senior Designers, and other colleagues to brainstorms to contribute their knowledge and creativity to the project. Concepts are evaluated and selected through design reviews with feedback from IDEO.org's leadership, clients, or users. Often, rather than choosing one idea over another, the promising elements of various ideas are combined. Visual thinking is encouraged; drawing forces decisions, and captures emotional content as well as functional characteristics (Brown, 2009). Sketching has also been shown to enable insights and the co-evolution of the design problem and possible solutions.

IDEO.org designs for delight by making people feel special, and appealing to emotions, not just functionality or rationality. The Kano model is a theory of product development and customer satisfaction that refers to an attractive quality, which is unexpected and will not cause dissatisfaction when absent but can provide great customer satisfaction and delight when fulfilled (Kano, N. Seraku, F. Takahashi, & S. Tsuji, 1984). Designing for delight can provide significant advantages over competitors. An IDEO.org staff member elaborates upon how designing for delight is a unique value that design brings to the social sector:

> Our concepts, whether they're experiential designs or digital or a service or a business, whatever it is, I think that we try hard to incorporate a level of a delightful experience in that because that's inherent in design, in the field of design itself. But I think that that's something that's also a unique value that design brings to this [social sector] field, and designing for low-income populations in vulnerable communities. Just because somebody doesn't have a lot to live off of and have a lot to spend and have a lot of opportunities doesn't mean that they don't love delightful experiences.
>
> As another example, that speaks to this point, I think that sets us apart in terms of our unique value is a project we did with American Refugee Committee in the DRC [Democratic Republic of Congo] where we designed this social enterprise called Asili. [It's] a social enterprise that consisted of three main components of the membership model, and you pay into the membership and you then have access to [a nutrition program], basic healthcare, and clean water up to a limit depending on what your membership is. Then, ARC is eventually going to start playing with other components, like what does it look like to add an education component to this, or what does it look like to add a financial literacy component into this. But for now it's just free.
>
> And the clinic that we worked with them to design really emulates some of what you would find not in the [United]States, but it emulates aesthetically a clinic where people are treated more fairly and transparently. One element that I'm talking about is, you get a number when you come in, wait in line or in chairs in this waiting room, and it's a white space, and the doctor has a lab coat. None of this sounds potentially novel […], but the feedback we got from most prototypes… They just went with the clinic design and we felt this brand that went with it too, because it was dignity-instilling. People come in, they get a number, they wait, they know where they are in line, and they have a chair. It's just these small elements of the design that came together that create something in which people feel more like people, and people who feel more like people who are going to have a good experience receiving health care.
>
> I think that's an example of how the delightfulness of a concept or of an idea influences its ultimate success. People are different everywhere but we're all still kind of the same. Everybody wants to be treated like they're special, so how do we design a mobile financial tool for teenagers in Chicago with Moneythink that makes them feel that way, and that's game-ified. Or how do we make them feel like they themselves are being looked out for, or they themselves are being spoken to by a brand. That's another area that I think we're good at. […] Because all those things attract people on a subconscious level. Like, "Oh this looks

cool" and they just walk over and then learn more. But that initial moment of getting their interest is really important. — IDEO.org Staff (S18)

Prototyping enables designers to experiment to gain the answers and feedback that will shape the solution, before investing a lot of time and energy (S18):

> The thing that makes the [HCD] process so different and special to me […] is prototyping. The prototyping leads to concepts that we're testing before financial investment is made by the actual partner. I think that prototyping in itself is unique in that sense. It's looking at what solutions could be before they've been committed to. — IDEO.org Staff (S18)

> Design in itself, design as a discipline, really comes into play during prototyping. One, it's a team of designers who are trained in design for the most part [who] are looking at the opportunity areas and saying, "How do we actually test to push on this a little bit more? What do we actually test to answer a specific question that keeps coming up? Like do you really feel this way, or are they just telling us that this is the case?" I think that's what sets us apart, how HCD takes it a step further.
> There are different research methodologies for sure, but a lot of research sort of stops there. I think where we have unique value is taking that a step further and designing these experiments with partners that are sometimes super uncomfortable for them, because we're pretending to be […] this system or this service already. What does that look like and how do we build it to be real just enough to elicit the answers and the feedback we need from the target group, is really where we shine. Then taking that feedback and then identifying ways we can test for what we heard, and again iterate upon those prototypes to deliver a concept that has been validated before someone is taking it forward. — IDEO.org Staff (S18)

> Coming from the architecture world, we only prototype when we're close to the end, like building the full-scale mock-ups. You've already figured out the design and you're just looking at prototyping as a process of refinement whereas within the HCD, design-thinking world, it's closer to what prototyping is within the product design world where it's part of the process of design. This idea that shifting prototyping in the timeline to an earlier point is something that I also picked up [from IDEO.org's Fellowship program]. — Former IDEO.org Fellow (S17)

IDEO.org designs strategies or services in addition to products. User experiences are prototyped with visualizations or narratives (e.g., personas or storyboards). Physical prototypes may also be fabricated with increasing refinement from sketch modeling materials (foam core, hot glue, etc.) to 3D printed or machined parts. An IDEO.org staff member emphasized how having tangible prototypes is a more effective way of understanding user needs:

> We've seen pretty much across the board that that's the best solution. Even if you're putting a Post-It on a phone and it's mimicking the screen flows, it's so helpful. Now we have different apps that we can use to better mimic that experience, but because so many of our projects are digital, and you're working with communities that aren't necessarily literate when it comes to using a cellphone, you have to get it into their hands. They're not going to be able to imagine what it's like when you click here or do this. You have to play that out for people. — IDEO.org Staff (S16)

Especially when projects have a small budget and short timeframe, IDEO.org tries to minimize complexity and use existing technologies and platforms to prototype. An IDEO.org staff member presented an example of how they were able to adapt existing mobile applications to develop a new mobile application:

> When we did the Moneythink project, which was designing an app for Chicago youth around financial literacy, which was I think a six-week project. So we didn't want to reinvent the wheel, we were trying to just use apps that already exist, that could test and prove the concepts. So like Snapchat and GroupMe were

> things that teenagers were already using, so how can we adapt them slightly but not take the time to create them ourselves. — IDEO.org Staff (S16)

One key difference between IDEO's and IDEO.org's design processes is that IDEO.org design teams tend to prototype much earlier (Wyatt, 2014). For some projects, the design team may only have one chance to interact directly with intended users and must ideate and prototype before going to the field to do user research. An IDEO.org staff member elaborated upon how having a small budget and a tight timeline meant IDEO.org needed to be "scrappy," and also "furthered [IDEO.org's] process and I think pushed [IDEO.org] to better work" (S16):

> Well, for one of the projects I was on, we only had one trip to the field, so it was a 12-week, maybe 14-week [project]. So instead of going into the field, doing some research, coming back and creating prototypes of this solar light, we had to create prototypes of the solar light before we even were able to interview people. So I think that we had to rely a lot more on our intuition. We had to be a little more anticipatory of what things we would hear in the field, and we relied a lot more on our partner who had done a bit of research already to give us some more direction. But I think ultimately it was pretty effective. We had very clear differences between our prototypes and then we got the feedback that we needed immediately. But it was certainly a scramble. — IDEO.org Staff (S16)

In summary, IDEO.org employs classic brainstorming methods for generating ideas, often engaging design experts from across the organization. IDEO.org has had to adapt IDEO's typical prototyping methods, however, to serve the less resourced environments in which it operates, often prototyping earlier and leveraging existing solutions more heavily.

6.6.2 IDDS's Ideation and Prototyping Phase

Typical methods for ideation and prototyping sometimes need to be modified to accommodate the wide range of languages, literacy levels, and design skills that are often present in IDDS teams. IDDS also recognizes that more outspoken or extraverted individuals may dominate a group discussion. In order to encourage and enable all IDDS participants to engage in all design activities, IDDS design facilitators are trained to carefully manage team dynamics. Design facilitators sometimes assign homework to teams before teamwork sessions to give team members time to develop their thoughts before having to express them in a group setting. IDDS teams discuss insights and ideas verbally, but written communication may be difficult for teams managing multiple languages and different levels of literacy. Team members with higher language and literacy skills might take more responsibility for documenting information throughout the design process.

IDDS teaches design teams methods that help them make more objective design decisions that are less influenced by emotions (Smith, 2015e). IDDS teams learn to convert user needs into design requirements (e.g., speed, power, cost, etc.) that can be measured and tested with simple experiments (Smith, 2015e). Teams brainstorm ideas and evaluate their concepts against those metrics with Pugh Charts (IDDS, 2014, p. 107-110). The Pugh Charts are intended to stimulate discussion and inspire combinations of positive attributes to improve concepts; Pugh Charts are not necessarily used to select the final solution.

The Director of IDDS encourages teams to carefully design experiments to learn as much as possible:

> You want to always be thoughtful about experimentation, and act in a way that moves you as far forward as you can. A lot of times we aren't as thoughtful as we should be about the experimentation. It is not a

laboratory experiment always; it can be something like conducting interviews with the community. Are we getting as much information as we can? Or building a sketch model. Have we designed it in such a way that we get most input from the user? Build a prototype. Have we built something that will give us the most information about what people will really use? — Amy Smith, Director of IDDS (Smith, 2015b)

Learning to use basic hand tools and building a simple functional device (e.g., water pump, solar lantern, etc.) are core components of IDDS's curriculum. Building physical prototypes with simple tools and materials facilitates communication and shared understanding among team members from different disciplines and cultures. The Director of IDDS encourages participants to build prototypes to increase their creative capacity (Smith, 2015f). IDDS teams often collaborate with local fabricators to create prototypes with commonly available processes and materials. Found or recycled materials or inexpensive parts like PVC pipes and steel stock are commonly used for prototyping. The Director of IDDS also encourages teams to build prototypes that are easily modifiable to facilitate co-creation with users (Smith, 2015f).

Thus, IDDS's approaches to idea generation and prototyping are different than IDEO.org's: IDDS more carefully constructs and manages ideation sessions to ensure that participants who might otherwise be hesitant to participate for a variety of reasons can do so. IDDS utilizes more systematic methods for concept selection, rather than relying upon expert guidance as IDEO.org does. In contrast to IDEO.org's rapid prototyping and sophisticated materials and machinery, IDDS uses locally available materials and tools for prototyping in order to engage local makers in prototyping, encourage novices with simple tools, and increase the likelihood of local production, maintenance, and sustainability.

6.7 Synthesis and Reframing

Synthesis is the process by which design teams distill what they learn from user research or prototyping into insights that can lead to opportunities for change or solutions. Some of these insights might lead to a reframing of what the problem is, and change the realm of possible solutions. Although synthesis and reframing are not identified as distinct phases in the design process, they are important activities that might occur during the Understanding Phase or Ideation and Prototyping Phase.

6.7.1 IDEO.org's Synthesis and Reframing

IDEO.org's Design Kit contains several methods for synthesis, including "Download Your Learnings," "Share Inspiring Stories," "Top Five," "Find Themes," "Create Insight Statements," and "Create Frameworks" (IDEO.org, 2015b, pp. 77-93). A Former IDEO.org Fellow noted that a distinguishing aspect of IDEO.org's design process is the rigor with which IDEO.org combines data from interviews, observations, and tests to synthesize or deduce insights:

[Synthesis] feeds in from the interview process in that we actually came out with this idea of doing these expansive interviews, taking copious amounts of notes and data, and translating that in pretty rigorous manner. It's not just that you're looking at your notes and saying, "Oh generally, I'm learning this," but you're rigorously going through and pulling out the data that you have gotten from the notes and that taking other data such as observations and testing data and putting that up and pulling that together, deducing it almost like a mathematical problem where you reduce, reduce, reduce until you get these major insights.

There's a lot more rigor to the way in which that process is carried out at places like IDEO, IDEO.org, frog, etc. than what I was using before […]. I always took copious amounts of notes, but I wouldn't

> necessarily reduce it in that level. It's made it easier. When you do that level of reduction, the data has a depth that you're able to portray to clients. They think it's super helpful. — Former IDEO.org Fellow (S17)

Perhaps more important than the initial problem framing is the flexibility and capacity to reframe the problem:

> In terms of finding projects that design can actually address, that's important. You want to make sure it's not an objective stance, say like doing design for design sake. It's important that it's actually something that can have a real and meaningful impact in places and there are tons of things that designers take on that really don't make any difference at all. It's fine, it's not to say those projects don't exist or shouldn't exist but especially when working for projects that are intended to have social impact, I think it is worth asking upfront, "Is this project actually needed? Is it going to make a difference?" This is part of why I do think this process of asking questions in different ways and being open to reframing the problem, is that sometimes you could get a project that really not going to make a difference but if you go through the process of exploring, you can figure out how to tilt it in a way that it will make a difference. Like something could be extraneous but if you go in and actually see that thing isn't really going to matter, this thing will, we can shift the project to be able to culminate this thing that will make a difference. If the process is open, it allows that to happen. That is super important. — Former IDEO.org Fellow (S17)

A former IDEO.org Fellow elaborates upon an example of how one project was reframed:

> We were sent in to figure out how to increase adoption of cookstove technology. What we found in exploration wasn't actually about adoption, like people understood the benefits of the stove, but there was a variety of different factors for everything from the cost of fuel to the fact that cooking on a stove was not that easy to do. So where people were spending money was on things that dramatically made their lives easier. The cookstove was not an aspirational object so this idea of a high-end cookstove that burned fuel super efficiently may not be great in a lot of markets because people did not consider it to be at that level. The best solutions may be something that fits into what they were willing to spend for things like stove technology.
>
> Lots of these different things where we were like, "You actually need to shift the thinking in how you're framing what the problem is." When we do these reframings, here are some recommendations for things you can do on the ground that can increase not the number of people who have cookstoves, but the number of people who actually use the cookstoves. It was this subtle shift. It wasn't so much about getting people to bring the cookstove into their home, it was about making it the technology that they might look to most of the time, if not all the time so they could actually get the benefits of the cookstove. That shift led to recommendations that were quite different than if we were saying, "How do you do something that gets people to believe in the cookstove and buy the cookstove?" and that wasn't the problem that we were finding. You can imagine those two different questions, you could solve in two different ways when it comes to design idea. If we had solved just for adoption, we could've come up with campaigns around cookstoves, or a pricing policy around cookstoves, or some market policy around cookstoves, which would've been an interesting design exercise, but not actually getting at the heart of the problem. We had to present it in a way that made the shift and could help the client understand the reasoning for making that shift. That project was interesting because it took the client awhile, even after we gave them things, to come around to that line of thinking. — Former IDEO.org Fellow (S17)

The reframing of a problem is typically based upon an insight or set of insights that shifts the way the team thinks about the problem. IDEO.org tends to use the "How Might We" format in which insights are distilled into questions starting with "how might we?" because it suggests that a solution is possible and because it offers design teams the space to answer the question in a variety of ways (IDEO.org, 2015b).

6.7.2 IDDS's Synthesis and Reframing

The IDDS Design Workbook contains several methods for synthesizing information, such as storytelling, user/customer profiles, and value chain mapping (IDDS, 2014, pp. 31-40). IDDS has adapted some of their methods to make it easier to co-create or build relationships with community members, and other stakeholders. IDDS encourages participants to find ways to use physical objects that stakeholders can interact with in intuitive ways (Smith, 2015d). The Director of IDDS specifically encourages teams to engage stakeholders in three-dimensional formats because it reminds people of playing with toys when they were children, and creates a good environment for building relationships and sharing stories:

> When people are making 3D things, it reminds people of when they got to do this as kids with toys. It is good for sharing stories. I recommend doing [a value chain] map creatively, like using 3D clay models of people rather than drawing on paper because [with paper], it is less easy to move things. The 3D way is a different kind of interaction. Interacting with things instead of paper is always a good thing. — Amy Smith, Director of IDDS (Smith, 2015d)

For example, an IDDS team in Zambia used a tangible activity to understand when farmers lost the most crops in post-harvest processing:

> One tool was developed in Zambia by a team that was doing post-harvest processing. They were trying to figure out where do you lose the most value of your crops. They developed a road map where they asked farmers to put beans where they lost the most crops. So they asked 20 or more farmers to come and put beans. So this allows them to find the critical place to have impact. They found that storage was the biggest challenge based on this tool. — Amy Smith, Director of IDDS (Smith, 2015d)

When creating a value chain map, IDDS teams have also used different materials to represent different strengths of relationships, such as metal wire for strong relationships and yarn for less durable relationships.

The Director of IDDS highlights how the process of problem framing and reframing follows the same interactive process of experimenting, learning, and acting as the general design process:

> I frame things in terms of experimenting and learning and acting. […] You will go through the cycle a few times as you are trying to frame the problem. You will not get it perfectly the first time around, but you should be able to a series of small experiments where you learn a lot and act in order to refine your problem so that by the end of the problem framing exercise you know who your customers are and what is the problem that you are solving, and the scope and size of the project. — Amy Smith, Director of IDDS (Smith, 2015b)

Broadly framed projects as well as narrowly framed projects can be reframed based on user needs or potential solutions:

> One of the projects that we had was a struggle because it was framed very broadly. It was a project that was "ICT for health." And it was just health, big big picture health. And therefore it took this group a very long time and a lot of research to actually hone in on one problem to focus in on. Whereas other teams, the problem that was handed to them was the avocados in this community are going to waste because there is no opportunity to add values to avocados. This is a very specific problem and that team did very well because they had something very specific to focus on and they managed to jump in. Whereas "ICT for health" was an entire category and sector and because we only had only 5 weeks, it took very long to boil it down. That is an example of two very differently framed projects […].

> Another example from the summer: there was a team that originally was [addressing] "income generation" - another extremely broad category. […] There was another category of projects called "bean threshing." That was the challenge in one of the communities, and nobody wanted to be in the bean threshing team. Nobody joined that team; a ton of people joined the income generating team. And within a week or two, they realized that the way we generate income in this community is through bean farming. Let's be on the bean threshing team. That team, in spite of how the challenge was framed very very broadly, was very quickly able to narrow it down. So again, that challenge was framed too broadly, but the team was able to react to it quickly. — IDIN Staff (S11)

For example, an IDDS brief initially focused on designing a device that heats and disinfects breast milk containing the human immunodeficiency virus (HIV). The team redefined the problem as preventing mother-to-child transmission of HIV, and developed a novel concept to chemically deactivate the HIV in breast milk as it passes through a nipple shield. The team received funding from the Bill and Melinda Gates Foundation to research this promising idea. The new problem framing enabled the team to explore an entirely new design space, leading to an innovation that is potentially cheaper, easier to distribute, and more discreet for mothers to use.

IDDS encourages the use of the Web of Abstraction or Webbing as a tool for exploring the design space and articulating potential problem framings (Kaufmann & Ramo, 2011). IDDS refers to the Web of Abstraction as a problem framing tree in order to make the tool more intuitive for farmers and villagers, who represent a significant portion of IDDS participants. As the team progresses from the trunk to the branches to the leaves of the tree, the problem framings are answering the question of "How," and the team is encouraged to think about possible ways to address the problem (IDDS, 2014, pp. 42-44). As the team progresses from the leaves, to the branches, to the trunk of the tree, the problem framings are answering the question of "Why," and the team is encouraged to think about possible causes of the problem. (See Figure 6.2 for an example of a problem framing tree.)
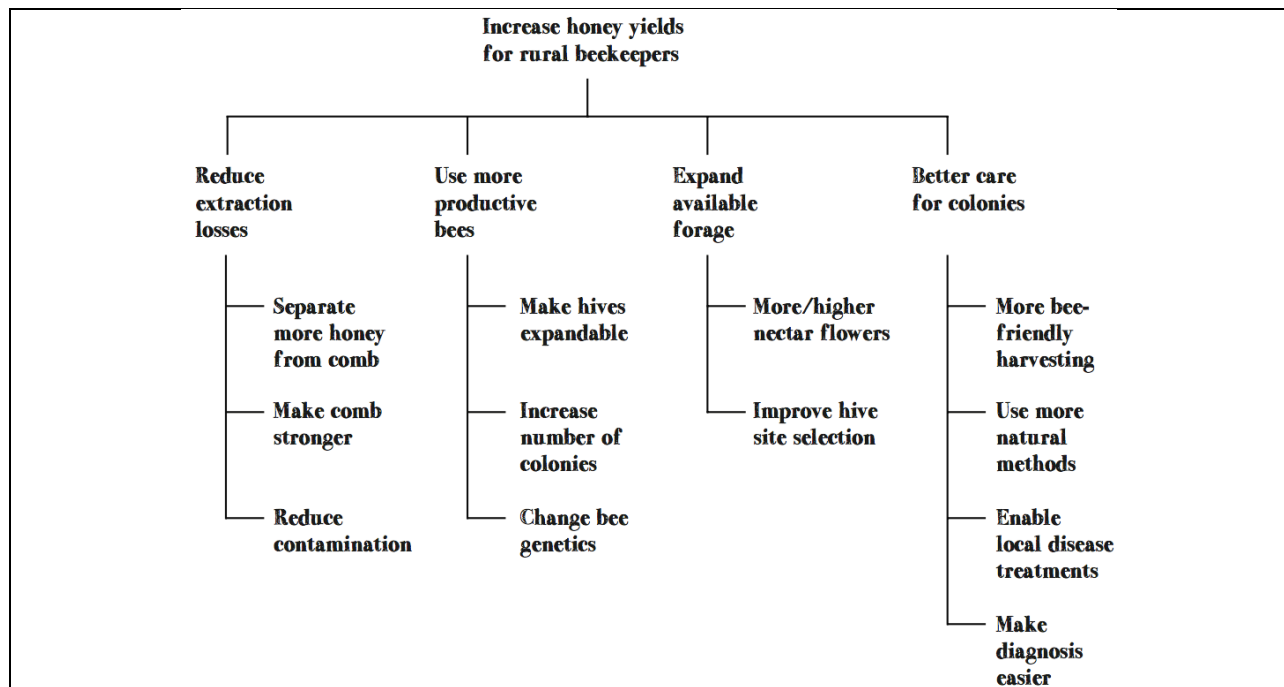

Figure 6.2. An example of a problem framing tree from IDDS's Design Workbook (IDDS, 2014, p. 44)

After teams have generated a number of alternative problem framings, they may select a problem framing based on their interests and what is most fitting for IDDS, considering the timeframe and resources available. In addition, since IDDS highly values impact and innovation, IDDS encourages teams to use an Impact-Innovation Matrix to select a problem framing based on what is likely to have the highest impact and also offer some degree of innovation (IDDS, 2014, p. 48-50).

IDDS thus differs to some extent from IDEO.org's approach to synthesis and reframing, largely because of the characteristics of the design team. IDDS uses more visual approaches and structured techniques that make the process more straightforward for less experienced designers and design teams managing multiple languages.

6.8 Implementation Phase

During the Implementation Phase, ideas move towards realization. Although there is a heavy emphasis on scalability in the social sector, an IDEO.org staff member reminds us that implementation entails multiple stages, including piloting a concept, refining it to ensure it works in a particular context, and then adapting it to suit other contexts:

> The scale question to me sometimes is challenging because we get a lot of pressure, our partners get a lot of pressure in the social sector overall. Everyone is being asked about scale plans. I very much appreciate that and recognize it, but at the same time I think that there's so much value in creating a design that works and is serving the target audience first.
>
> So for example, in the Zambia work, our mandate was to design for urban […] women living in Lusaka. What that meant is that we had to get to know what their lives were like, what are their goals and aspirations, what's the culture that's most influencing them, and then produce a design that attracts them to the service. Now whether or not that design could be airdropped in Iowa and have the same effect remains to be seen. But it was built for a specific group of people based on their interest areas. So if we went to a different context, with Kenya for example, there are elements that we're seeing of the Diva clinic that are very applicable and could be used in the Kenyan communities that we're working in, but they also need some tailoring and some customization to be culturally relevant to these people that we're serving there.
>
> I think my ultimate point is that yes, we're always wanting to work to scale, but we always want to be validating the designs in the communities that we're objectively serving first and that our partners are reaching out to us about before we think about scaling. Because if you don't have something that works somewhere, you're going to have something that doesn't work anywhere. It has to be rooted—there's something that has to be rooted at the community level to make it successful. So I think we're learning a lot about that too, like how do we both design the thing and plan for its scale.
>
> Tim Brown [the CEO of IDEO] has a quote that he says about this which sort of struck me because it's awesome, but he's like, "There are a lot of people out there in the world that tell the one to one thousand story or the"—and I'm quoting this based on what I heard, not verbatim but what I took from what he said, and he's like, "There are a lot of wonderful organizations and companies out there telling the story of scale and one of the biggest and best stories that we tell as an IDEO family is a zero to one story. So people come to us and they've tried everything, and they're still not reaching their goals, and if we can get them that first success and show that first piece of value in our work together, then we are prepared for scale. But we have to get from zero to one. And the zero to one story is super important, and it's the entire foundation on which scaling solutions depends on."
>
> So for me, it's been interesting to think through that and answer that scale question because that's one of the first questions I get from our funders who are asking about our portfolio and partners, like, "What is your plan for scale?" And it's like, "Well, we need to make sure it works. If it works, we're committed to scaling it. Even better, if it works, we can segment the design at some point and figure out which components are specific to this group of people." For example, the Diva clinic is super sassy, really aspirational; it's a kind of sexy. But if we were to drop that in West Africa, they would be like, "What?

> Like, no, this is so offensive to us." So through having something that works, we're able to decipher what about it is customized to that community, what about it is really applicable to youth everywhere. That's how I think about it when I think about scale. — IDEO.org Staff (S18)

The HCD process is intended to produce context-specific concepts that meet user needs. In order for scale to occur, the concepts must be adapted to meet the nuanced differences in user needs in the new context in which it is deployed.

6.8.1 IDEO.org's Implementation Phase

As consultants, IDEO.org's impact upon end users is dependent upon whether partners decide to implement the concepts. Consequently, conveying a plausible story of a compelling need and solution to the client is critical. Sometimes, this story itself is the deliverable and the tangible product may be a "slide deck" presentation, which contains insights evoking empathy for users and inspiring ideas for clients. Stories, user profiles, quotes, and pictures are commonly used to convey research findings within an "Insights and Opportunities" framework. Prototypes may be conceptual ideas or looks-like renderings that are meant to capture the imagination. Sometimes, detailed artifacts (e.g., a financial model, customer journey, sample advertisement) serve as examples of how a concept may come to life. However, regardless of how promising a concept is or how well its value and actionability are communicated, partners may decide not to implement. The project may no longer be a priority to the organization due to a shift in strategy, change in leadership, or budget constraints. Despite these challenges, 38.5% of the 64 projects IDEO.org completed from 2011 to 2015 were in the market as of November 2015 (IDEO.org, 2015c, p. 23).

Designing for scale is one the main reasons why IDEO.org assigns a business designer to project teams (S18):

> [Designing for scale] is one of the primary values of a business designer on projects. We're hiring business designers left and right on contracts around here [at IDEO.org]. But I think having that brain on the project—and [IDEO.org's] partnerships [staff members] think about that too a lot, like "What is your scale plan? Do you have a scale plan?" — But the business designer sitting on the team and doing the work is able to determine the feasibility of our concept, the sustainability it could have in the organization, the business model. I think just preparing organizations and equipping them with those models is really complementary, and it's just as needed as presenting them with something beautiful that attracts people of all corners of their target audience. It's just as important to have a plan for how to take it forward through the business design. — IDEO.org Staff (S18)

IDEO.org has also found that digital products, such as applications or services based on mobile phones, are easier to scale, but is intentionally maintaining a diversified portfolio of projects (S16):

> Certainly, we want to see more impact in the world, and [designing digital products] is one really easy way to do it. I think because uptake of digital products, namely cellphones in sub-Saharan Africa is remarkable. We can design for both feature phones and smartphones. That's definitely intentional. But we certainly don't want [digital products] to ever be all of our portfolio of work. We love to have a couple products, tangible things, in the mix because those are amazing stories. They're really easy to grasp, and they're pretty inspiring for our designers to work on and know that this thing is out living in the world. So I think we have to make sure we maintain a variety of different projects and a variety of different deliverables that come out of them. — IDEO.org Staff (S16)

According to IDEO.org's Executive Director, although there are some benefits to local innovation and local production, mass manufacturing can more easily achieve scalability and can also produce better outcomes:

> For instance, we're working right now with the Ethiopian Agricultural Transformation Agency (ATA) to design a test planter for small holder farmers in Ethiopia to be able to more effectively plant their fields. When we went to Ethiopia, we actually saw solutions that farmers themselves had actually hacked together using Coke bottles and rods, and put together seed planters that could certainly work better than the current method of broadcasting seeds where you throw out handfuls of them and they land wherever they may. However, when we measured what the yields would be of a metered, very precise seed planter that we would design and work to manufacture via a combination of local manufacturing facilities combined with parts manufactured in China, where parts could be produced precisely to scale, what we found was that the seed planter that we were able to design using metering technology and more precise parts was much more effective at increasing yields than the soda bottle solution that was manufactured locally.
> There's certainly something to be said for locally produced products. The great thing about them is that these locally-produced ideas can spread—farmers can share them with one another and they can copy them from each other. — Jocelyn Wyatt, Executive Director of IDEO.org (as quoted in Skillbridge, 2015)

IDEO.org's desire to scale and achieve significant impact leads it to drive its implementation work through partner organizations. With the Project-Based Consulting Model, IDEO.org itself was not engaged in the process of bringing a solution to life and ultimately to market, as its involvement typically culminated with project reports that present key insights, opportunities, guiding principles, and implementation plans.

6.8.2 IDDS's Implementation Phase

For IDDS, implementation refers to refinement of a physical prototype, fabrication, testing and evaluation, and gathering user feedback. IDDS presents two ways to disseminate a technology at scale: mass production versus the "million maker" model. In the former, one maker makes a million things, whereas in the latter, a million makers make one thing. IDDS believes that co-creation is possible with either model, and does not have a preference for scaling through the million maker model or through mass production:

> The spirit of co-creation can still exist in a scaled product because if your process of designing it is participatory, then you still achieved something that had co-creation at its spirit and if you are able to scale that through factory production, and you are still getting success and people want it, great. But if you scale by a million maker model, that is great too. So there is no preference. We have seen products scale in both ways. — IDIN Staff (S11)

IDDS acknowledges that there are advantages and disadvantages for both models of scaling and dissemination. Designing and developing a product for mass production requires significant funding, technical expertise, and a long timeframe, but may reduce costs with economies of scale and offer superior quality control. However, the "million maker" model offers adaptability and opportunities for creative capacity building in low-resource settings:

> One of the things that they [IDDS instructors] encourage people to design for is design for scale. So think about the beginning how you think that product is going to scale. If you are going to spread that product around the world, how is it going to happen? Is it going to happen by teaching everyone in the world to make it corn-sheller style. [MIT D-lab designed a corn sheller that can be made by hand with

minimal skill or tools.] Or is it going to spread because you are going to manufacture it yourself and ship it around the world? There are plus and minus for both. This is literally from one lesson that happens in IDDS.

The advantages of central production are things like quality control. You can make sure that every product looks like every other product. Whereas if you are teaching everyone to make it, you cannot ensure that there is quality control. You don't know what everyone will do. One of the advantages of central production was that it is cheaper at scale to make one additional mass produced item than to have somebody locally source the material. So each additional item produced is less expensive. You get economies of scale. It is more expensive to do that locally. But what you don't get is local adaptability where you might be producing something that is appropriate in one area but does not fit in other areas.

If you have the "million makers" model, where you have a lot of individuals making things, then they are going to adapt it to their needs and their communities, and there will be more capacity on the ground if you have individual people doing it than if you just have people being forced to buy it because they don't know how to make it themselves. — IDIN Staff (S11)

IDDS ends with a final presentation at a public event at which community stakeholders are invited to give feedback on the teams' prototypes. Since IDDS focuses upon engineering design and innovating early-stage technologies, most teams produce a functional prototype but have not yet refined the business model or dissemination plan. Although it may take years for the prototypes to become products ready for market, IDDS' connection to academic research institutions provides a means for work to continue beyond the conference. Since there is usually no client or funder for the project, IDDS helps participants raise funds, recruit new team members, form partnerships with implementers, or found new ventures. Some participants return to IDDS with new project ideas or to further work on a previous IDDS project. Thus, implementation looks quite different for IDDS which may take a variety of approaches, and does not necessarily have a partner at the ready to which to hand off its work.

6.9 Discussion

For both IDEO.org and IDDS, a Key Activity is the HCD process; it is the means through which they innovate and create value. IDEO.org's design process and IDDS's design process can be considered HCD, but there are differences in their particular approaches to HCD. Differences in the design processes appear to be influenced by factors, such as: IDEO.org's Project-Based Consulting Model and IDDS's Creative Capacity Building Model; IDEO.org's prioritization of achieving measurable impact and IDDS's prioritization of stimulating personal transformations; and IDEO.org's core discipline of industrial design and IDDS's core discipline of engineering.

The influence of an organization's participatory philosophy on the participation of users in design processes

Co-creation and user-created design are essential for achieving IDDS's goals. According to IDDS, "It is our goal to demonstrate a model where a *user-based* community of active, creative designers can invent, innovate and inspire each other to create new technologies" (IDDS, 2013, emphasis added). Moreover, IDDS believes that creating technologies helps people feel more in control of their lives, and fulfills the need to achieve their full potential (Smith, 2015a). Practicing "expert-led design" and designing *for* users would not achieve IDDS's goals. The philosophy of IDDS is based upon the personal philosophy of the Director of IDDS:

> D-Lab and IDDS have always functioned based upon [the Director's] intuitive and experience-based philosophical approach, which is influenced heavily by Unitarian principles ("the inherent worth and dignity of every person," "justice, equality and compassion in human relations," and, "the use of democratic principles in society at large,"), early exposure to the Swadeshi Movement in India and the teachings of Ghandi (self-sufficiency through the revival of local production and traditional production techniques), and anti-Apartheid activist Steven Biko (psychological liberation as a pre-condition to progress). — (Taha, 2011, p. 20)

Given these values, it is natural that IDDS would prioritize the development of relationships with community members, and strive to engage users in every aspect of the design process.

Unlike IDDS, IDEO.org does not try to engage users in every aspect of the design process. IDEO.org design teams primarily practice expert-led design and designs for users. I refer to IDEO.org's participation philosophy as "designers as experts" because of their belief that designers have an intuition or creative ability that enables them to go beyond meeting stated needs to realize dreams. According to two former IDEO.org Fellows, the mindset of "designers as experts" may result from how designers are trained to seek inspiration from the context, interpret users needs, and create compelling solutions that go beyond what users might directly request. With this mindset, it is understandable that IDEO.org design teams tend to engage users most often during the Understanding Phase to gain information and during the Prototyping Phase for feedback on prototypes (S16). Users are not necessarily involved in executing the concepts or activities that require specialized skills, such as graphic design or product design (S16). Especially considering the rapid pace of IDEO.org's design consulting projects and need for high-quality deliverables, it makes more sense for experts to execute concepts than to invest time and resources in capacity building for users.

The influence of an organization's business model on partner or project selection

With the Project-Based Consulting Model, IDEO.org does not implement directly, but partners with client organizations that implement. IDEO.org has a dedicated partnership team with years of experience assessing, forming, and managing partnerships. Their partnership selection process is based more on expert intuition than a rigorous set of criteria or metrics. IDEO.org is intentional and thorough in the partner selection process because partners heavily influence the project direction and are essential for achieving measurable impact.

With the Creative Capacity Building Model, IDDS is trying to inspire and support people from various walks of life in creating technologies and launching social enterprises. IDDS's projects are vehicles for learning and the means of achieving IDDS's ultimate goal of creating and empowering social innovators. Projects also provide opportunities for achieving social impact but achieving impact through projects is not the primary objective of IDDS. Although partnering with implementation organizations might increase the likelihood of IDDS projects achieving impact, IDDS tends not to partner with organizations because the team's autonomy and ownership of the project is important for educational value and personal transformation.

IDDS instructors used to do project selection and problem framing through expert-based intuition. Since 2013, local organizing teams have had full responsibility and autonomy in project selection and problem framing. In order to help novices in selecting projects and framing problems, IDDS instructors developed guidelines and training videos for new IDDS organizers. Project selection criteria consider the potential social impact and scalability, but also include several other factors that will increase the likelihood of participants being personally transformed by the IDDS experience.

The influence of an organization's mission on stakeholder relationships

IDEO.org and IDDS use some similar methods for gathering information, including observations and interviews. However, the emotional quality of the interaction between the design team and users is drastically different. IDEO.org's engagement with users is primarily for the purpose of furthering the project and achieving measurable impact. IDEO.org's interaction with stakeholders is empathetic but professional:

> It's a pretty emotional, consuming experience to go somewhere like Nairobi or Mumbai or Ghana, into the slums. It's like any new experience. It's very intense and so being ready for that, being able to… I don't want to say distance yourself because that sounds like you're not taking it in, but there is some part of looking at this as part of your work. Being in these places and saying, "Ok I'm here to do a job," and connect with people and understand the environment, but also not get overwhelmed by the intensity of the emotional experience. — Former IDEO.org Project Lead (S21)

In contrast, IDDS engages with users or community members to have meaningful connections, which are a key component of the personal transformation experienced by participants. For example, IDDS encourages participants to "remember that you are not just getting information, but rather you are building relationships with real people" (IDDS, 2014, p. 22). According to an IDDS instructor, some personal transformation "comes strongly from people who engage in the summits, who are affected often deeply by their interaction with both people in community and in poverty" (IDDS Faculty, S2). For IDDS, engaging stakeholders in the design process is a way to build relationships:

> We are building relationships that will last well beyond the summit and the first way that we do this is the way we talk to people when we're getting their information. So make sure that we value people's time and that were are collaborative and cooperative, and that we are listening well, and that we make sure that we connect back to people in the process. Make sure to bring them back into the co-design sessions that we have. Engage them in giving feedback. Those are great ways to engage. — Amy Smith, Director of IDDS (Smith, 2015b)

The influence of organizational values on decision-making processes

IDEO.org tends to rely on the intuition of experts and the design team, whereas IDDS tends towards the use of systematic methods at several points in the design process. Partner or project selection, problem framing, synthesis, and concept generation are points in the design process where this distinction occurs. This is perhaps because the qualities IDEO.org is assessing are hard to define and quantify, and requires an expert eye to identify. For example, IDEO.org's concept selection process is expert-based and intuitive, perhaps because "great design" is not quantifiable:

> Great design in the eyes of designers is beautiful and beautifully conceived, and form follows function in a way that is incredibly harmoniously executed. It's truly useful and it understands how it's going to be used in the context in which it's going to live and be used in. It's innovative in its use of materials or color or technology or whatever. I think those are some of the stuff. When I see something and I think, "Dammit! I wish I had designed that, that's really good." Those are things that really matter to me. — Former IDEO.org Project Lead (S21)

In contrast, IDDS's concept selection process is quantitative and metric-based. IDDS teaches the Pugh chart method, which is commonly used in the engineering field, IDDS's core discipline. Since IDDS believes in equity and co-creation, teaching democratic processes in

which everyone can voice their opinions and have equal decision-making power is aligned with its ethos. Furthermore, since IDDS is an educational conference, providing detailed step-by-step methods may be more accessible for novices who may not yet have the intuition that experts have developed. Participants can also use these methods after the conference in many different settings, where expert-review may not be an option.

The influence of project type and disciplinary focus on prototyping methods

IDEO.org and IDDS work on different types of projects. Whereas IDDS almost exclusively focuses on products or technologies, most of IDEO.org's work involves the design of services, programs, and systems:

> We [at IDEO.org] think about design in a really broad sense. Designing a product, is certainly one element of that, but actually the majority of our portfolio of work is about designing services, businesses, programs and systems. A small portion of our portfolio at IDEO.org is actually related to designing products. That's probably 20% of the work that we do and most of it is about designing really cost-effective systems, services, and businesses for people in the developing world. Products are expensive to develop. The times when investment is worthwhile is when you can actually get that product manufactured at scale. — Jocelyn Wyatt, Executive Director of IDEO.org (as quoted in Skillbridge, 2015)

Business, services, programs, and systems can be developed and launched in a shorter timeframe than physical products, and are more aligned with IDEO.org's objective of achieving measurable impact.

Although products require more investment and a longer timeline to develop, products are well-suited for IDDS's Creative Capacity Building model. People living in low-resource settings use products, like farming tools, in their daily lives, and have some level of experience and intuition about them. Tangible, physical products also serve as a useful vehicle for learning the design process with a hands-on, experiential approach. In addition, since many IDDS instructors and university partners work in the field of engineering, it is understandable that IDDS design process includes some more quantitative and analytical tools, such Pugh Chart analysis with technical metrics.

In particular, the project type influences the choice prototyping methods. Some prototyping methods (e.g., sketch modeling) are better suited for physical products, and others (e.g., roleplaying) are better suited for experiences or systems. The disciplinary focus of the organizations also seems to influence the choice of prototyping methods. Some of IDEO.org's prototyping methods (e.g., operational models to test ergonomics) are more commonly used in industrial design (Wölfel, 2008). For example, the IDEO.org's design team produced operational models to test the ergonomics for the Evocam endoscope (see Figure 6.3 and Figure 6.4). Since IDDS's core discipline is engineering, IDDS prototypes tend to prioritize functionality and focus less on aesthetics or ergonomics.

Figure 6.3. IDEO.org's operational models test ergonomics (Reineck, 2012)

Figure 6.4. IDEO.org's Evocam endoscope (Zepeda, 2012)

The importance of tangible interactions

It is important to note that engaging in tangible experiential interactions with stakeholders (e.g., during the Understanding Phase or Prototyping Phase) appears to be conducive for both achieving measurable impact and generating a personal transformation for design teams. IDEO.org and IDDS have each developed ways to adapt classic design methods to be more accessible and applicable for the social sector. Using visual methods or making abstract concepts tangible with physical representations is a common strategy. For example, IDEO.org and IDDS used a similar method to understand how and why a farmer's crop spoils before it gets to market. Teams created cards representing different steps of post-harvest processing, and asked farmers to indicate where they lost the most crops by placing beans on the cards (Smith, 2015b; IDEO.org, 2015b, pp. 102–103). In contexts in which design teams have different cultural and socio-economic backgrounds than the intended users, tangible prototypes or props may facilitate communication and stimulate more meaningful feedback than asking the user to imagine and react to abstract descriptions of concepts. An interesting direction for future research would be investigating whether this pattern of using prototypes or tangible props during user research is common across other successful projects.

The influence of organizational mission on implementation (product development versus piloting and scaling)

IDDS tends to focus on early-stage product development, in which teams do user research to identify user needs, generate concepts, and test early ideas with sketch models and prototypes, but have not yet developed a product that is ready for market. At the end of IDDS, teams may present proof-of-concept prototypes to community members, but they are not necessarily finalized concepts. IDDS teams invite feedback and encourage stakeholders to contribute ideas or suggest modifications to the prototype. Several years of product development may be needed before the product is ready to pilot. Early-stage product development is more conducive for teaching novices the design process than later-stage product development because more technical expertise (e.g., manufacturing skills) is needed as the product becomes more refined.

When IDEO.org has worked on product development, the products that have produced measurable impact were later-stage product development projects, in which a direction had

already been identified, or there were existing prototypes or business models and the challenge was to pilot or scale up the concept. At the conclusion of design projects, IDEO.org teams present concepts to clients in as compelling a fashion as possible. They present insights and opportunities supported by pictures and quotes from users and other key stakeholders to evoke empathy. They have a clear stance on the problem and have developed actionable pilot or implementation plans. In addition to focusing on different stages of product development, there are other important factors that influence the rate of project progress. IDEO.org teams are able to progress further and more rapidly on projects than IDDS teams because IDEO.org has longer project timelines, more resources, more expertise, and partnerships with experienced implementers. It is clear that IDEO.org's HCD process and Project-Based Consulting Model is designed in order to increase the potential for innovations to reach scale, and that IDDS's HCD process and Creative Capacity Building Model is designed more to support the empowerment of social innovators than to scale innovations.

In this chapter, I have shown in depth the ways in which an organization's mission and strategy affect the choice of tactics employed from design methods to project team formation. The next chapter will explore in further detail two-project case studies demonstrating the differences in the design processes of IDEO.org and IDDS.

Chapter 7

Comparison of Two Drinking Water Project

Case Studies

7.1 Chapter Overview

The previous chapter presented a broad comparison of the general design processes of IDEO.org and IDDS. This chapter presents a more in-depth and detailed perspective of IDEO.org's and IDDS's respective approaches to design by comparing two project case studies. Both of these projects focus on providing clean drinking water to communities in emerging markets. The following project case studies were selected based on access to public information, and my ability to conduct participant observations and interviews with project team members. The SmartLife project is an example of IDEO.org's Project-Based Consulting Model, in which professional design teams partner with social sector organizations to design scalable products and services. The Zimba project is an example of IDDS's Creative Capacity Building Model, in which IDDS supports budding innovators in designing appropriate technologies and launching social enterprises. The support is in the form of an educational conference that teaches the design process, and access to funding and mentorship after the conference. (See Table 7.1 for a high level comparison of the SmartLife and Zimba projects.)

This chapter is organized into five sections. Section 7.2 provides a summary of IDEO.org's SmartLife project and Section 7.3 provides a summary of IDDS's Zimba project. Section 7.4 highlights similarities or shared principles exhibited by SmartLife and Zimba. Section 7.5 describes key differences in the design processes and design teams of SmartLife and Zimba. Section 7.6 presents frameworks for project analyses and demonstrates their application to SmartLife and Zimba. Section 7.7 identifies potential factors that influence the progression of projects from the design stage to the pilot stage based on IDEO.org's and IDDS's respective approaches to HCD.

The themes discussed in this chapter emerged from key informant interviews with members of the SmartLife and Zimba design teams and current or former employees of IDEO.org and IDDS. I also analyzed various documents, such as project blogs and case studies, and drew from my participant observations to aid in the interpretation of interview data. As a

member of the IDEO.org SmartLife team in 2012 and Zimba team from 2009 to 2011, I was a participant observer and contributed towards user research, design, and prototyping activities.

Table 7.1. Comparison of project attributes for SmartLife and Zimba

	SmartLife	Zimba
Organization and Program	IDEO.org Fellowship	IDIN IDDS
HCD Model	Project-Based Consulting	Creative Capacity Building
Project Sector	Water, hygiene, and nutrition	Water
Design Team	Architect, business strategist, and engineer led by an industrial designer	Engineering students led by an electrical engineer familiar with the target communities
Motivation	New sales channels and the opportunity to multiply health benefits for users by integrating water, nutrition, and hygiene	Personal mission of an Indian inventor to improve the lives of the poor through innovative technologies
Project Brief (How might we…)	Design a scalable business to sell water alongside nutrition and hygiene products to urban Kenyans	Design a device to automatically add the appropriate dose of chlorine to water as it flows out of hand pumps
Deliverables	Customer research, business models, financial analyses, brand strategy in the form of a slide deck	Early-stage functional prototypes, posters, project report
Implementation Model	Partnering with organizations with access to funding, credibility, and infrastructure for rapid implementation	Supporting a local inventor and social enterprise

7.2 Summary of IDEO.org's SmartLife Project

Globally, water, hygiene, and nutrition challenges result in poor health outcomes. Annually, 3.5 million people die from water-related diseases and 1.7 million children under five die from diarrheal disease (Bigio, Ogbu, Friedberg, Vechakul, & Shipp, 2012, p. 3). One out of three people in developing countries have vitamin and nutrient deficiencies (Bigio et al., 2012, p. 3). In Kenya, where 61% of the population has access to clean water, diarrheal diseases are among the top ten causes of morbidity and mortality, and 84% of preschool-aged children have vitamin A deficiency (Bigio et al., 2012, p. 5). There have been mixed results in tackling these challenges independently from one another. The SmartLife project was based on the premise that by tackling these challenges collaboratively, the health benefit would be magnified while reducing the resources required to implement.

In April 2012, IDEO.org partnered with Water and Sanitation for the Urban Poor (WSUP), Unilever, and the Global Alliance for Improved Nutrition (GAIN) to design a scalable business selling clean water along with hygiene and nutrition products (e.g., vitamins and fortified foods) in Kenya. WSUP Enterprises is a specialist business unit that builds, strengthens, and expands clean water and sanitation enterprises serving low-income consumers. Unilever's New Businesses Unit works with social sector partners to incubate new businesses that address development challenges while creating new markets and contributing to core business targets for Unilever. GAIN is a Swiss foundation that invests in public-private partnerships that address malnutrition.

The eight-week project required an accelerated timeline that was not typical of IDEO.org projects (IDEO.org, 2015d). The team could interact with end users only during a single ten-day field research trip to Nairobi. User research, prototyping, and customer feedback sessions needed to be completed during that trip. In order to be as prepared as possible, the SmartLife team needed to brainstorm ideas and make prototypes *before* conducting field research. The team

leveraged IDEO's professional prototyping facilities to make branded artifacts that looked refined enough to be credible. "One idea was Live Well, a dummy brand with a logo and brand collateral that could be used to set up a business prototype on arrival in Kenya" (IDEO.org, 2015d).

In Nairobi, the IDEO.org design team conducted interviews with 50 people, including 28 consumers, 13 entrepreneurs, and one government agency (Bigio et al., 2012, p. 16). They explored issues, such as water and health needs, market value, and seasonal variations (IDEO.org, 2015d). A key question was whether water, hygiene products, or nutrition products would be the driver. The design team learned that customers bought water from kiosks, but had to carry heavy water containers to their homes, pay high prices, and face sporadic shortages (IDEO.org, 2014b). It became clear that clean water was the driver. "People understand the importance of clean water, but it is a luxury that few low-income people can afford or access consistently" (Bigio et al., 2012, p. 18). Insights from user research helped the design team reframe the problem:

> In the SmartLife project, […] we were told [by the clients], "Sell water, sell products." But based on what we were told in the interviews, we came back and said, "Actually, products are not the problem." Some of the products, especially where they affect kids, could be something that somebody would be interested in, but water here is a pain point so this problem that you sent us out to solve for, of how to set up a social enterprise to sell clean water and health products, is not the right question to solve for. [The problem] is to set up a business to sell clean water, and then you could wrap in some of these other things in there. What people have as a serious pain point is reliable, clean, affordable water. — Former IDEO.org Fellow (S17)

Another key insight was that women are the decision-makers around water and health: "The woman is the main champion of health in the household. We found that women often purchase the water and products and ask health-related questions. Even in male-headed households, men defer to the women on such matters" (Bigio et al., 2012, p. 22).

To delve deeper into understanding user needs, two design team members continued to conduct additional interviews, while the other two design team members prepared the prototyping materials. Using their hotel suite as a prototyping workshop, the team set up a photo studio and print shop to make a product catalog, business cards, and brochures. Based on insights from observations and interviews, the design team prototyped two fully functional kiosks, one mobile sales cart, and a home delivery service. For the first Live Well prototype, the team paid a water kiosk vendor and cart operator to role-play as Live Well employees. The vendor and cart operator wore branded Live Well shirts and sold hygiene and nutrition products and water in jerry cans that had been adorned with Live Well stickers (IDEO.org, 2015d). The team also paid their translator to role-play as a Live Well door-to-door salesperson, selling hygiene and nutrition products and gauging demand for home water deliveries (IDEO.org, 2015d). According to Robin Bigio, an IDEO.org Project Lead, "It was completely chaotic but fertile with learning experience" (IDEO.org, 2015d). The prototype demonstrated that strong branding (e.g., the professional appearance and consistency of branding across touch points) inspired trust (IDEO.org, 2015d). Whereas customers might suspect a single door-to-door sales representative of being a scam artist, the mobile sales cart and physical retail site enhanced Live Well's credibility (IDEO.org, 2015d). The team also realized that a subscription model, in which customers ordered and paid in advance for water, would reduce the physical demands of transporting unsold jerry cans of water, and would also enable optimization of the delivery route (IDEO.org, 2015d).

The design team integrated insights into the next prototype, which they launched three days later in a different neighborhood in Nairobi. In addition to changing the name from Live Well to SmartLife, the team asked customers to place orders at a kiosk and make a down payment for

water delivery. Unilever's strong brand was critical for the success of SmartLife. "In an environment littered with counterfeits and scams, people place high value on well-executed and established brands, like Unilever, Coke, and Safaricom" (Bigio et al., 2012, p. 19). "People were willing to give money up front for service that would come the next day, which is unheard of in Kenya," says Bigio, "We discovered that there was an aspirational side to this business. People were excited about having a great source of drinking water" (IDEO.org, 2015d). When the market testing was complete, the IDEO.org team visited customers to let them know that SmartLife was still at a pilot stage and had not yet launched as an official business. They refunded the down payments and gave out jerry cans of clean water to compensate SmartLife customers for their participation (IDEO.org, 2015d). Selling 520 liters of water during two days of prototyping was a testament to the potential of the business model.

Upon returning to the IDEO.org office in San Francisco, the team continued to develop other aspects of the SmartLife business. The team developed a financial analysis, accounting for the cost and quantity of water that could be treated and transported, the space requirements for a treatment facility and retail store, and pricing strategies (IDEO.org, 2015d). The service model described each step of the customer's journey, including the following steps:

1. A SmartLife sales agent comes to the customer's home weekly to take sales orders.
2. Customers order and pay for water, health, and nutrition products on a weekly basis.
3. Orders are sent to the SmartLife treatment facility, where water is filtered and delivery containers are filled.
4. Water and product orders are delivered by truck and carried into customers' homes by SmartLife delivery staff.

The team also refined the SmartLife brand to highlight the convenience and reliability of the service rather than the traditional focus on health that most water initiatives emphasize. SmartLife is "a strong woman-friendly brand coupled with a high touch subscription service for clean water, hygiene, and nutrition products" (Bigio et al., 2012, p. 23). The team proposed a pilot testing two concepts: Aspirational Wellness (drinking water with curated personal care products) and Everyday Essentials (all-purpose water with familiar household and hygiene products) (Bigio et al., 2012, p. 31).

In February 2013, six months after the IDEO.org project concluded, the SmartLife pilot was launched with seed funding granted by Aqua for All. The three representatives from the client organizations are overseeing the pilot, while five full-time staff are managing and running the pilot in Nairobi (SmartLife, 2015). None of the IDEO.org SmartLife team members were directly involved in implementation.

Is SmartLife a Success?

Success can be defined by different metrics. For a consulting firm, a project being implemented by the client may be considered a successful adoption of their recommendations and concepts. It may also be considered a success for a social enterprise to establish a service that satisfies its customers. Winning design awards from prestigious design associations may also be considered a success. SmartLife would be considered a success based on these definitions of success. However, as is common with other social enterprises, SmartLife is still developing its model for financial sustainability and scalability. These markers of success are much more difficult to achieve.

For the SmartLife pilot, kiosks were opened in the Nairobi neighborhoods of Ongata Rongai and Pipeline (Hewens, 2013). Customers could choose the convenience of a prepaid subscription with free weekly home delivery or the flexibility of purchasing products, as needed. SmartLife customers receive high-touch service and can pay for services and products through M-PESA's mobile payment system (IDEO.org, 2014b). Within its first year of operation, SmartLife provided water subscriptions and/or wellness products to more than 4,200 customers (IDEO.org, 2014b). As of August 2014, there were 150 customers who subscribed to SmartLife's monthly water delivery service in Kenya (IDEO.org, 2015e). Families comprise 90% of sales, whereas the remaining 10% are businesses (IDEO.org, 2014b). As of September 2014, SmartLife had sold more than 167,000 liters of clean water (IDEO.org, 2014b). SmartLife has also received positive feedback from customers, with many customers willing to promote the service to others (IDEO.org, 2014b).

In September 2014, SmartLife earned an award from the American Institute of Graphic Arts (AIGA), the oldest and largest professional membership organization for design. SmartLife was one of 19 case studies featured in AIGA's "Justified" competition for demonstrating the value of design in a clear, compelling and accessible way. Cameron Campbell, a juror for the Justified competition commented on his support of SmartLife:

> People matter and giving them control over their own situation is powerful. SmartLife integrates a community by solving their problems in a way that offers not only clean water, but also a system and business in which they all participate. – (IDEO.org, 2014b).

A former SmartLife design team member comments upon how SmartLife's success can be evaluated based on the success of the design as well as the success of the implementation:

> You can think about success for a project like SmartLife in two ways. One is the design phase, the part about analyzing and doing research in the field, coming up with the system, prototyping and outputting the beginning of a business model and idea. I think you can evaluate that, in which case I would say SmartLife was successful. But then, in the real world, does this business make sense? Does it work? Is it sustainable? Is it having impact on the metrics that it's trying to change, or not? In which case, I don't enough about how SmartLife is doing today to evaluate it, quantify it. — SmartLife Designer (S21)

Another SmartLife designer agreed that the IDEO.org team was successful in delivering the design of a scalable business model that their clients enthusiastically championed:

> Ultimately, we wanted to give something that would help them launch the business, but I think the main success factor was figuring out what does this thing look like in order to leverage the capacity of our clients, but deliver the best impact. I think that a big success factor was…They came to us with this idea that they wanted to do this, but they had no idea of how to do it. For us to get to a point where we could say, "Here's actually a viable path of how to do it," was a huge success factor, and a reliable path that actually reflected the reality on the ground and not just the aspirations of our client. So to that point, we came in and the question was a water and health business, and either we're doing door to door or we're doing the kiosk model or we're doing the delivery model. That was all that there was upfront. Our ability to say, "Actually, to better address the things on the ground, here's the way this systems needs to look like." It was the nuances of how that system could operate and use that to shift our clients from where they started and also make sure we were incorporating the voices of the people on the ground as to what their real pain points were and what there aspirations were. That was the success, at least within IDEO.org where we could get to. Doing it in a way that resonated with our clients. At the tail end of that project, they were so unbelievably happy. They clapped, cheered, were enthusiastic and so also creating something for them that looked a little bit different that what they thought but actually they could still find resonance with and want to champion and push ahead.

> I've been on tons of projects, not necessarily at IDEO.org, where you give the client something but it goes and it sits on a shelf and doesn't get done so to produce something that the client was willing to take forward and implement was a huge success on that project. I think then…helping them see certain (I wouldn't say flaws in their thinking), but helping their thinking shift more towards to what was actually realistic to be achieved. Certain things like focusing on drinking water as opposed to all types of clean water and really focusing on water first and then bringing in products and health education behind, I think those were shifts we were able to make. — Former IDEO.org Fellow (S17)

SmartLife was also considered a success in terms of client satisfaction, and the familial relationship between SmartLife employees and their clients:

> In terms of the business getting up and running, [SmartLife] was a success. It was used as a model project within Unilever. […] SmartLife and Clean Team [a sanitation service designed by IDEO.org for Unilever] were pointed at as good successes for it. […] In terms of immediate community and people surrounding it, it's been seen as this great business that's come in. With the [SmartLife] workers, it's really interesting to talk to them because they describe the community (their clients) as their family. Like they'll get a call [saying], "Hey I don't have any water. Can you deliver this?" or "My relatives are coming. Can you deliver this?" or "I cannot afford to pay this week. Can we figure something out?" At those discrete levels, it's a success. — Former IDEO.org Fellow (S17)

Although SmartLife may be considered a success at the pilot stage, SmartLife has faced some challenges with scaling up:

> In terms of the ultimate success of the project, getting the thing on the ground and actually making a real impact in the communities that the project is situated in and being able to achieve some sense of scale. I think they are well on their way in item one, but I think the scale thing is the thing that they've been struggling with which I think there are a variety of factors that have contributed to that, but it's also part of the idea that projects are still evolving. — Former IDEO.org Fellow (S17)

Since the design phase of the project was eight weeks, with only ten days in the field, there were still implementation details that had not been fully figured out. A SmartLife designer commented that the outcome could have been better if the team had more time, or if the client continued to experiment before trying to scale up:

> We handed over a business plan and a pilot design program which was great, but I think if we had more time, we would've done another round of field prototyping with higher fidelity and built out the business (what to build), but still be in an experimental mode. Instead, I think what was hard was that the client took that as the final version and built it out without experimenting very much. It could be a long time to iterate around some of the delivery systems and pricing models and so on, which I think made it harder for the business to flourish. Had they been more experimental upfront, it would've been better. — SmartLife Designer (S21)

In terms of figuring out a financial model that is sustainable, SmartLife is still evolving. Some of the challenges with designing a comprehensive financial model are typical of other social enterprises, not just SmartLife (S17):

> I know they've had problems with the financial model. This has actually changed in some respects […] because the model [the IDEO.org design team] constructed was very rough. There's also been a change over from the people who are working on the ground with the project versus who worked with us as the design team. So there's a little bit of a challenge in the transference of things. Some of that is the capacity of WSUP on the ground and the people they had staffing it and figuring that out at a larger level. […] I think it's something that's evolving. — Former IDEO.org Fellow (S17)

> I think these challenges they might be having with the financial model in SmartLife are typical […] of a lot of the multi-nationals who are doing these social impact projects. We can think about the finances on the big picture in terms of initial funding. But the thing that is required to continue, to keep things moving forward: Does there need to be social engagement or behavior change funding? And what does that look like? And how does that work in tandem with the other practices of the business in terms of how it's making money? What is it spending money on? – That that is all further resolved upfront is something that is not just about SmartLife, but is typical of a lot of projects in the social enterprise space. — Former IDEO.org Fellow (S17)

The implementation phase of SmartLife would have benefited from more formal check-ins with the design team (S17):

> I think if there were an informal like, "Continue to talk to us as you're developing out things." Because where we ended, there was still a good nine months of work that needed to happen to get it to a point where you could launch the pilot. […] I think it would've been helpful to have more formal check-ins with the design team or with folks at IDEO.org as they were developing things to, to bounce off ideas, to build in more feedback loop systems.
> But I think that's something that also models the IDEO.org model shifting more to prolonged relationships in a sense, as opposed to just a discrete project can address that issue. I still struggle with that. I think it's one of the challenges of the consulting model because a lot of this stuff is in such a defined period time so if you don't set something up where there's these additional engagements, things can get lost. I've noticed both with projects where I had that marked out, that often times, the non-profit or the company that is moving things forward needs a little bit more of a kick-start. I try to put in now things where there's low hanging fruit, like these are things you can do tomorrow. It seems like there's that, plus just checking in regularly to see how things are moving forward. — Former IDEO.org Fellow (S17)

The SmartLife project largely followed IDEO.org's design process as summarized in Chapter 6, and was a success by most measures although time will tell if the solution can be scaled. Since the completion of the project, however, IDEO.org has shifted from a Project-Based Consulting Model to a Programmatic Model with long-term partnerships, multiple design engagements, and design support throughout implementation to help clients navigate challenges as they arise. This shift was undertaken in part based on the learning from projects such as SmartLife, and subsequent challenges with taking the solutions to scale.

7.3 Summary of IDDS's Zimba Project

Chlorine is affordable, readily available, and effective for treating most waterborne pathogens. However, the education and behavior change required to properly use chlorine for water treatment have been barriers to adoption. At the 2009 IDDS conference in Ghana, an inventor from Kolkata, India proposed a project to design a device to automatically chlorinate water in villages. Since then, the design team working on this project has changed in size and level of involvement, depending on the needs of the project and the availability of the volunteers. The composition of the team has ranged from the inventor primarily working independently to a team of about 11 part-time volunteers (Zimba, 2015). The backgrounds of team members have included engineering, business, marketing, industrial design, product design, human factors, and project management (Zimba, 2015).

The IDDS 2009 Chlorine Dispenser team designed and prototyped a device that would accept intermittent and variable water flow and automatically dispense an appropriate amount of chlorine into the water. The technological design was based on the notion that automatically

chlorinating water sources would minimize the behavior change needed for people to treat their water. After IDDS 2009, the Chlorine Dispenser team recruited students from the University of California, Berkeley and the Massachusetts Institute of Technology to continue the research and development of the technology.

In the Chlorine Dispenser project returned to IDDS in 2010. The 2010 IDDS in Fort Collins, Colorado shifted the focus "from the creation of technologies to their dissemination" (IDDS, 2010). At the 2010 IDDS, design teams worked on various stages of dissemination, including "redesigning their product for manufacture, fleshing out the nitty gritty details of their business plan, or working out the best way to set up a supply chain" (IDDS, 2010). The Chlorine Dispenser team re-branded their team and product as *Zimba*, based on the name of Mr. Zimba, a team member who joined the team during the 2010 IDDS. The Zimba team brainstormed ideas for business models and decided to sell chlorine dispensers to non-governmental organization (NGOs) that could provide the maintenance and servicing (Zimba Designer, S4).

Over the next few years, the Zimba team developed a robust device that fits directly onto hand pumps or community taps and automatically chlorinates water to a safe concentration without electricity or moving parts. Zimba has partnered with NGOs, social enterprises, and research centers for pilots in India and Bangladesh. During a one-year pilot with Paul Polak's Spring Health venture in Orissa, India, a single Zimba chlorine dispenser served 200 families before the company decided that it was more profitable to manually chlorinate one tank of water at a time instead of using the Zimba (Hess, 2014). The Zimba team also sold seven chlorine dispensers to GOAL, an Irish NGO with operations in India. However, GOAL's water program was discontinued due to shifts in the funder's priorities. In 2013, Zimba was founded as a for-profit company with a patent pending for the chlorine dispenser (Hess, 2014).

Is Zimba a Success?

The Zimba project can be considered a success in terms of technological innovation and early adoption. In 2012, researchers from Stanford University, the Centers for Disease Control and Prevention, and the International Centre for Diarrheal Disease Research, Bangladesh conducted 12-week evaluation of the Zimba chlorine dispenser in low-income urban neighborhoods in Dhaka, Bangladesh. The study included 24 households in the control group and 30 households in the treatment group. Only 8% of the 84 samples of stored Zimba-treated water from households in the treatment group had E. coli >10cfu/100ml, whereas 28% out of 96 samples of stored untreated water from households in the control group had E. coli >10cfu/100ml (Amin et al., 2013). Among the users who kept using the Zimba chlorine dispenser for the entire duration of the 12-week study, 83% were satisfied with the device, 88% believed that drinking Zimba-chlorinated water is healthier for their family, and 50% stated their household would be willing to pay $0.13 USD per week for chlorine refills and continued access to the Zimba chlorine dispenser (Amin et al., 2013). The study concluded that the Zimba "automated chlorine dispensers provided accurate and consistent dosing of free chlorine" and "also successfully reduced E. coli contamination in drinking water" (Amin et al., 2013). After the study ended, two Zimba chlorine dispensers continued to be used for a year and purified two million liters of water (Hess, 2014).

However, Zimba faces technological challenges in terms of scaling up production and developing a sustainable business model. As of April 2014, each Zimba cost about $100 and required 1.5 days to manufacture (Hess, 2014). The Zimba consisted of two assemblies: (a) injection molded plastic parts that had to be plastic welded together, and (b) a food-grade

fiberglass water reservoir. The founder of Zimba welded the injection-molded parts himself and closely supervised the fiberglass contractors since the components needed to be airtight to function properly. Students in an MIT D-lab course "Design for Scale" suggested that the fiberglass reservoir be thermoformed to improve quality and manufacturability, but the Zimba team did not have the capacity to perform the necessary fluid dynamics modeling (Hess, 2014). The Zimba team wanted to increase sales but did not have a scalable business model, and could not justify investing in a more streamlined manufacturing process without greater demand (Hess, 2014).

Zimba has achieved early adoption, but is still in the process of navigating the technological and financial challenges of scaling up:

> At one point, we estimated there are more than 3000 people using Zimbas, but it's also hard to tell because we didn't have usage monitoring or anything like that. There were Zimbas installed where they could be theoretically 3000 people using, but we actually don't know. Over time, it's changed. The number of installations has changed with pilots starting up and stopping. […]
>
> I guess I would consider it in progress in that it's been many years, and yet there are still many challenges that we need to address with the technology itself and the business model, and it hasn't scaled in a sustainable way… Yet, it seems like it could have some potential that we are still exploring. — Zimba Designer (S5)

Despite these challenges, Zimba has demonstrated great potential as a technological innovation. In 2015, PATH (a nonprofit organization that is a leader in promoting global health innovation) identified Zimba as one of thirty game-changing health technologies that will accelerate progress over the next 15 years towards achieving the United Nations Sustainable Development Goals (PATH, 2015). According to an independent impact assessment, technologies like Zimba could save 1,515,000 children's lives and 1.2 billion USD between 2015 and 2030 (PATH, 2015, p. 18).

The Zimba project largely followed IDDS's design process and exhibits several of IDDS's values and principles (see Chapter 6). In line with IDDS's support of local innovation, the Zimba project was led by an inventor who is native to Kolkata and familiar with the local language and culture of the surrounding villages that were the initial target beneficiaries of the chlorine dispenser. Exemplifying an asset-based approach that leverages local capacity, the Zimba chlorine dispenser was designed with locally available materials and fabrication techniques to support local production and maintenance. It was also designed to operate in resource-constrained environments with variable water flow and no electricity or fuel.

The Zimba project met the primary goal of IDDS to teach the design process, and is one of the few IDDS projects that have progressed through the pilot stage to early adoption. However, the Zimba team is still figuring out ways to address challenges with scaling up. Since several of Zimba's challenges (e.g., access to capital and technological resources) are shared by other IDDS projects, IDIN is developing strategies and resources to better address them (see Section 5.5).

7.4 Shared Principles Exhibited by SmartLife and Zimba

Both SmartLife and Zimba reached new customers with new offerings providing safe water. For SmartLife, the business was the enabler, whereas for Zimba, technology was the enabler. SmartLife's innovation is a high-touch subscription service providing customers with reliable delivery of clean water. Rather than inventing new technologies, SmartLife operates with

existing technologies. In contrast, Zimba's innovation is a device that minimizes behavior change and offers robust functionality in resource-constrained environments. The Zimba dispenser makes automatic chlorination affordable for communities without electricity or piped water. The following sections highlight similarities or shared principles exhibited by SmartLife and Zimba.

7.4.1 Importance of Local Liaisons in Navigating Cultural Differences

The SmartLife and Zimba teams had team members who were from a different cultural and socio-economic background than their intended users. Each team had a different way to manage these differences, but both recognized the importance of local knowledge. Local liaisons help foreign stakeholders better understand the cultural context, especially during the understanding phase and prototyping phase when the design team is engaging most with users.

For IDEO.org's Project-Based Consulting Model, local liaisons are critical for coordinating user research activities and navigating language and cultural differences. The SmartLife team hired a Kenyan marketing firm to set up interviews and arrange for translators prior to the team's arrival in the field. The marketing firm's knowledge of locally available resources and business practices in Nairobi facilitated a smooth prototyping experience. The marketing firm arranged for local interpreters to role-play as a door-to-door salesperson, kiosk operator, and delivery person. With several foreign aid organizations providing subsidized or donated goods and services in Nairobi, the IDEO.org team did not want any preconceived notions of foreigners or foreign aid to influence customers' reactions to SmartLife. A SmartLife designer emphasized that having a committed local liaison contributed to the success of the project:

> One other thing which was amazing about that project was that we had this incredible fixer in Nairobi that really made all the craziest ideas that we could think of come to life, like renting the market stall and finding a truck to deliver jerry cans and buying jerry cans and filling jerry cans. In general, I think designing and prototyping in places like Kenya are particularly exciting because you do have a lot of freedom to try stuff out. What made this project special was that the fixer was especially committed and good. There was a budget for it and so we could try and do pretty experimental things in a short amount of time where normally that's really hard. — SmartLife Designer (S21)

Since IDDS's Creative Capacity Building Model aims to increase local capacity for technology creation, the IDDS 2009 organizers solicited design challenges from IDDS participants who were intending to implement projects in their home region. In the case of Zimba, an inventor who is a native of Kolkata, India proposed the project at IDDS in 2009. Although the inventor of Zimba has a bachelors degree in electrical engineering and is from a higher socio-economic class than the low-income communities that he aims to serve, he has years of experience volunteering for non-profits that work in low-income communities and speaks the local language. Based on these experiences, the inventor of Zimba is familiar with the culture in these communities. As an avid inventor, he was also familiar with locally available materials and resources for making and maintaining technology. With this knowledge, the inventor of Zimba designed the chlorine dispenser to function with no electricity or fuel since these energy sources are not reliably available in emerging markets. The Zimba chlorine dispenser has no moving parts, which typically wear down and need to be replaced. The device also works with regular or intermittent water flow, making it suitable for piped water sources, hand pumps, or water reservoirs. Zimba can also accommodate water collection with various sizes of water vessels, and thus requires minimal behavior change. The Zimba chlorine dispenser consistently dispenses

appropriate dosages of chlorine and produces little chlorine aftertaste in the water, making it acceptable to rural villagers, who may dislike water with a strong taste.

7.4.2 Implementation Requires a Committed Champion

SmartLife and Zimba both have committed champions who move the project forward. For IDEO.org's Project-Based Consulting Model, the project champions during the design phase are typically representatives from client organizations. Two SmartLife designers said that the three representatives from the client organizations were project champions who ensured that the project went forward to pilot after the design phase (S17, S21):

> [The project champions were] the three people from our client team that were with us. […] They believed in the project. — SmartLife Designer (S17)

> They really trusted the work that [the IDEO].org team produced, and so I assume that they were also committed for that stuff to be taken seriously and executed upon instead of just used as inspiration. — SmartLife Designer (S21)

These clients joined the IDEO.org design team in conducting field research. Involving clients in the design process facilitated buy-in. Clients could hear for themselves what customers were saying and the realities of the situation on the ground. The proposed solution was more compelling since they were brought along in its development.

During SmartLife's implementation phase, the project champions were the newly hired project lead and engineering lead:

> WSUP Enterprises ended up hiring [a project lead and engineering lead]. It was really up to them to implement it. I think because they were the project champions ultimately. They really dug in through all the stuff we produced and really tried to internalize it. I remember they would write to us asking for the original vector files of the logo so they could print it in a particular way. There were lots of signs of commitment. Having calls with them around trying to understand why we made certain decisions. — SmartLife Designer (S21)

The transition of staff members and project champions demonstrates the importance of IDEO.org's new Programmatic Model for long-term partnerships and design support throughout implementation.

For IDDS's Creative Capacity Building Model, the project champions are typically students or community members who become inventors or social entrepreneurs after participating in an IDDS conference. The inventor of Zimba was also the project champion leading the Zimba team throughout product development and implementation. Zimba's inventor was the consistent driving force for moving the project forward, although various team members have joined and transitioned to other activities. The inventor's charisma and passion for the project has inspired volunteers to join and retained four of the initial IDDS team members. A Zimba team member said that the inventor was the main reason that the project has maintained momentum:

> We had [Zimba's inventor], who really cared about this and was willing to spearhead and champion this project and put in a lot of his time and personal resources. I think you need someone like that. If we did not have [Zimba's inventor], Zimba wouldn't have happened. He is just willing to put in so much work and time into this that the teams feels that we should support in any way we can because there is someone who is that passionate and enthusiastic about this. — Zimba Team Member (S6)

Although Zimba's inventor has been able to champion the project and keep the momentum going, it would have been helpful to also have a businessperson as a counterpart:

> I think [Zimba's inventor] is a really good engineer and innovator and a visionary behind the product. I don't think he is the right person to run the day-to-day business of having a company or product like Zimba and disseminating it because that is not what he is passionate about and excited about. So if we had someone who is willing to take on that role, and set up, and say, "I am going to change this into an enterprise and go forward in this." And, "I really want to care about the logistics and make sure this happens." Then that will be awesome. — Zimba Team Member (S6)

> One of the challenges with [Zimba's inventor] is that he hasn't found a business partner, and he's not interested in being that, developing the business side. — IDDS Staff (S1)

> At MIT, you read some of the research […] about the typology of CEOs that go on and become successful and what they need; and yes there could definitely be a mismatch between that and someone who is an innovator. — Zimba Team Member (S4)

The Zimba and SmartLife case studies suggest that a project may require one type of project champion during the design phase, and another type of project champion in the implementation phase. Visionaries or inventors may be more important during the initiation or design phase of a project, whereas program managers or businesspeople may be more important during the implementation phase.

7.4.3 Importance of Key Partners in Accessing Key Resources

For both IDEO.org and IDDS, partnering with other organizations was critical for gaining access to key financial and human resources. IDEO.org was founded by IDEO, a world-renown design firm. The SmartLife team was able to use IDEO's prototyping facilities and project space to design the logo, brand, product labels, and brochures before heading to Nairobi, Kenya for fieldwork. Access to professional designers and high-quality printing facilities enabled the team to produce sophisticated branding, which enhanced the credibility of the prototype business. As key partners and clients, Unilever, WSUP, and GAIN provided project funding and technical advice.

IDDS was founded by the D-lab at the Massachusetts Institute of Technology (MIT). As an IDDS project, Zimba is connected to various resources through D-lab. D-lab eventually became the financial administrator for Zimba's grant from the National Collegiate Inventors and Innovators' Alliance. Several students worked on various aspects of the Zimba project through courses at MIT and the University of California, Berkeley (UC Berkeley). D-lab staff and students could also access technical advice, prototyping materials, and workshops at MIT. A UC Berkeley professor also connected the Zimba team with a post-doctoral researcher at Stanford, who conducted a field trial of the Zimba chorine dispenser in Dhaka, Bangladesh.

It is important to note that a partner organization's position in the larger context of the global system of development influences the level and type of support they can provide. IDEO.org's partners are implementers, whereas IDDS's partners are academic institutions that provide mentorship and some technical assistance. The implementers of IDEO.org's projects are typically established organizations with access to funding and significant experience successfully implementing projects at scale. In comparison, the implementers of IDDS's projects tend to be

students or people living in low-income communities. These groups tend to have much more limited access to funding and other resources that are necessary to implement projects at scale.

Thus, IDEO.org and IDDS projects share a number of elements in common, particularly around their engagement of others in the projects. Both focus on gathering data at the local level, using liaisons to facilitate that process. Both require, as is shown in the innovation and new product development literature, a strong project champion (Pinto & Slevin, 1989). Finally, both engage with partners that provide additional knowledge and resources needed to bring their ideas to life.

7.5 Key Differences Between SmartLife and Zimba

The previous section provided an overview of the core principles exhibited by SmartLife and Zimba. This section describes the differences between SmartLife's and Zimba's respective design processes and design teams.

7.5.1 The Design Process

As noted in Chapter 6, IDEO.org's and IDDS's design process can be structured in the phases of understanding the problem, ideating and prototyping possible solutions, and implementation. This subsection will provide an overview of the activities conducted by an IDEO.org design team during the SmartLife project and activities conducted by an IDDS team during the Zimba project. The differences in these activities led to vastly different outcomes.

The Blend of Understanding, Ideating, and Prototyping

In IDEO.org's and IDDS's educational materials, the Understanding Phase is presented before the Ideation and Prototyping Phase in the design process (IDEO.org, 2015a; IDDS, 2014). In the Understanding Phase, the design team conducts user research to understand the needs and context of the user. In the Ideation and Prototyping Phase, the design team generates many ideas and creates prototypes or tangible representations to test the most promising ideas. Interestingly, in both the SmartLife and Zimba projects, the design teams ideated and developed prototypes before interacting with intended users.

A SmartLife designer commented that the SmartLife design process was radical, yet productive (S21):

> [SmartLife] was actually pretty radical. We changed things up. We probably would go do research and then off the back of research, design solutions and then prototype and test and then iterate. We actually left for Nairobi with a lot of stuff. We already thought, "Okay, let's try these different types of businesses." We already created a brand. It turned things upside down in a really productive way. Yes, I think the pieces are all similar, but we definitely turned things on their head quite a bit. It made it a pretty special project. — SmartLife Designer (S21)

Inspiration for several SmartLife concepts emerged from expert interviews and brainstorming before the design team conducted field research in Kenya. One of the client organizations for SmartLife recognized an opportunity to create a new channel by reaching customers at their doorstep. This client was interested in having a high-touch service that would provide opportunities to develop a relationship with customers and market new products. The SmartLife

design team interviewed experts from Living Goods about their model of micro-franchisees going door to door to promote and sell health products. Some aspects of SmartLife's branding were inspired by Living Goods. The SmartLife team designed and created brochures, stickers, T-shirt designs, and other branded materials at IDEO's office in San Francisco before leaving for Kenya to conduct user research (Vechakul, 2012). As shown in Figure 7.1 and Figure 7.2, there are notable similarities between the uniforms (e.g., blue cap, branded white T-shirt, blue duffle bag) of the Living Goods representatives and those of the SmartLife.
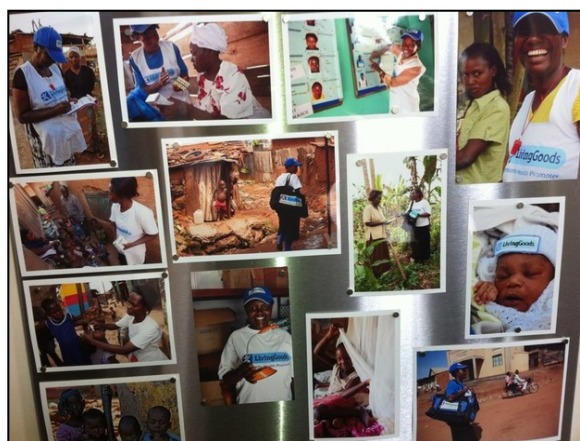
Figure 7.1. Living Goods sales representatives (IDEO.org, 2013)

Figure 7.2. SmartLife sales representative (IDEO.org, 2013)

The SmartLife design team also brainstormed each of the channels for the SmartLife business model before leaving for Kenya to conduct user research. As shown in Figure 7.3 and Figure 7.4, the SmartLife design team had brainstormed the concepts of a retail location or kiosk, a subscription service, and a delivery system for water and health products.
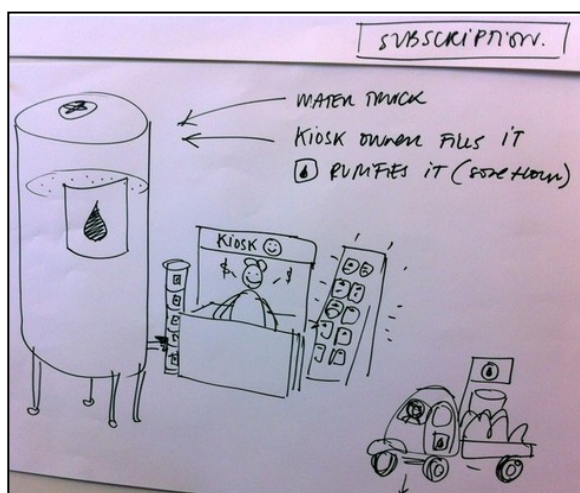

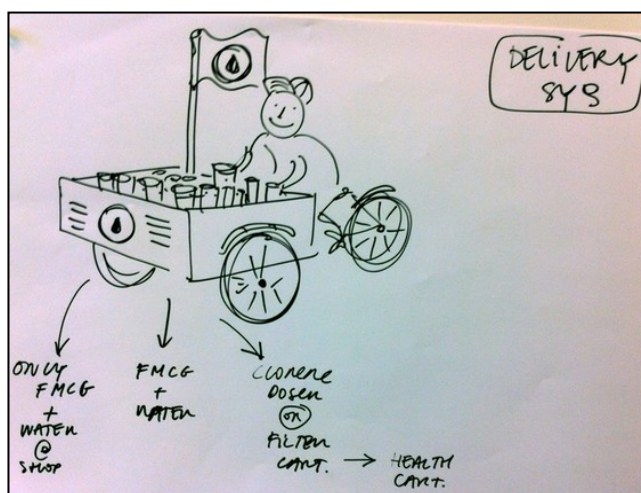**Figure 7.3. SmartLife subscription and kiosk concepts (IDEO.org, 2013)**

Figure 7.4. SmartLife water and product delivery concept (IDEO.org, 2013)

When asked how IDEO.org's design process is different from that of IDEO's, the Executive Director of IDEO.org commented that IDEO.org teams prototype earlier and more

boldly (Wyatt, 2014). At most, IDEO.org design teams have the opportunity to interact with end users twice. When IDEO.org design teams go to the field to do user research, they usually go with prototypes. A SmartLife designer commented that combining the user research or Understanding Phase with the Prototyping Phase was born out of necessity, and resource and time constraints:

> It was born out of necessity. We were resource-constrained, time-constrained; we knew we could go to the field only once and we testing very big assumptions. Had we had the option of laying a proper research phase, maybe with some live prototyping, and then going back to the [United] States, and then going back out to the field with a better, more developed prototyping phase, most likely it would've looked differently. But it was the conditions under which the project was running; we ended up with this joint research-prototyping-research phase, which I think worked out great. I think we still made a lot of assumptions and leaps when we were designing the final solution phase. Had we had time to do multiple iterations of prototyping or spent time in the field separately, I think we would've ironed out a lot of those questions. If you look at the amount of time we spent in the field and the outcome, I think that's what made the project successful. — SmartLife Designer (S21)

IDDS also teaches its design teams to "Understand" before they "Ideate and Prototype." This sequence of the design process appears to be influenced by their philosophy of co-creation, which is described as follows:

> Co-creation "is not designing *for* a community, but it is designing *with* the community. If you are coming with a solution then you are not designing with the community. You have not even consulted them, let alone involve them." — IDIN Staff (S11)

> What should [the design team] do when they visit the community first? […] Show up with a completely open mind and ask questions because they don't know what the problem is yet. […] Don't go with your plans and your charts and your prototype. Show up and learn and talk to people. — IDIN Staff (S11)

The inventor of Zimba had developed a prototype of a chlorine dispenser in India before attending IDDS 2009 in Ghana (S5). The inventor of Zimba had some familiarity with user needs and the context of the users based on his prior experience volunteering for organizations that install hand pumps in villages near his hometown of Kolkata. One might argue that having a local stakeholder on the design team provides some insight that would have been revealed during a team's initial visit to the target community.

When teaching the design process, it may be clearer and easier to portray the design process as distinct sequential phases. Although the Understanding Phase is presented before the Ideation and Prototyping Phase in IDEO.org's and IDDS's educational materials, the reality of design practice is less linear and sequential. Alternative representations, such as IDEO's portrayal of the design process as a system of overlapping spaces (Inspiration, Ideation, and Implementation) may more accurately describe design in practice (Brown & Wyatt 2010, p. 33). A design thinking team may be in two or three spaces simultaneously, and the transition through these spaces is not necessarily sequential (Brown, 2008). As demonstrated in the SmartLife and Zimba project case studies, context (e.g., time and resource constraints) may require design teams to start at a different place in the design process and move through the process in a nonlinear fashion (Beckman & Barry, 2007).

Prototyping Strategies

The SmartLife and Zimba design teams took vastly different approaches to prototyping. The SmartLife design team prototyped their business concepts in the market by selling water and products to customers. The Zimba design team did significant lab testing, refining the technical design of their prototype before testing in the field. Differences in their respective prototyping strategies result in part from designing a business versus developing a product. SmartLife could readily test their business model concepts in the market since they were using existing technologies. In comparison, Zimba needed to do significant research and development to refine their technology to a safe level of accuracy and consistency before piloting with users. In addition, the organizational context of IDEO.org and IDDS may have also influenced the prototyping strategies. SmartLife's prototyping activities were intended to launch a social enterprise, and were well funded by implementation partners. In contrast, some of Zimba's prototyping activities were motivated by academic research, and as such had to abide by the protocols and requirements of their academic and research partners. Zimba also had limited access to funding and prototyping facilities.

SmartLife's Prototyping Strategy:

IDEO.org's Creative Director refers to the form of prototyping used by the SmartLife team in 2012 as "beta typing," and highlights the advantage of learning faster when design teams are able to test in the market in real-time:

> Most things are harder about being a designer in this space [of working on poverty-related challenges in the developing world], but prototyping is the one thing that's not. If you're in the U.S. and you want to say, let's actually open a store and see what merchandise sells, that's not the easiest thing to do, by tomorrow; right? But if you're in Kenya, you can make those things happen. We use the term here beta-typing because you can actually be in the real environment and learn from the market, not in a simulated way, but from a way of actually saying, let's just make it happen and see what we learn.
> So this is a project where we partnered with Unilever, and the nonprofit Water and Sanitation For the Urban Poor, and the Global Alliance For Improved Nutrition. And set out around a hypothesis that said, "What would happen if we made a consumer facing offer that brought together water and health access?" So we tried a bunch of things. And this really happened in two weeks. And so we get to different questions. We get to more nuance questions. And we get to answers faster. Because we're able to do it in real-time, and learn. And so we're able to say, if we want to figure out whether people will buy water in advance, let's get our interpreters to act as water sellers and see what happens. — Patrice Martin, IDEO.org's Creative Director (Martin, 2012)

In emerging markets, it is possible to do bolder prototyping than would be allowed in developed markets. A SmartLife designer commented on how fewer regulations in emerging market contexts fosters a liberating environment for prototyping but also requires more ethical considerations:

> In general, I think designing and prototyping in places like Kenya are particularly exciting because you do have a lot of freedom to try stuff out. — SmartLife Designer (S21)

> There's a lot more freedom to experiment. There are a little bit blurry moral lines. I think that's one area that needs much more thoughtful thinking around. Definitely the crazy prototyping that we did on SmartLife or other prototyping that other IDEO.org teams have done, that stuff would never fly in the [United] States or in Europe. A lot of it would be illegal! People would be suspicious, offended. We would definitely get in trouble with the authorities — maybe I'm exaggerating a little bit. Life in Nairobi is messy.

> There are not many rules; there are not many guidelines or behaviors that you need to abide by. In that way, creative prototyping can really thrive in that because there are no rules and prototyping has no rules. There are no forms to be signed. There's no permits to be requested. And that stuff is actually really liberating. — SmartLife Designer (S21)

Without a business license, the SmartLife team was able to prototype a business selling drinking water, hygiene, and nutrition products in Nairobi, Kenya. The SmartLife team spent ten days in Nairobi, and during four of those days, they ran two rounds of prototypes in two different neighborhoods (Bigio, 2012). Translators, acting as SmartLife staff, recruited customers, took sales orders and payments, and delivered products to customers' homes (IDEO.org, 2014b). Prototyping made ideas tangible so the team could more deeply understand their customers' needs and how the service would fit into their daily lives. One of the clients stated, "I estimate we saved probably six months of time in the market through our one week exercise" (Phung, 2013). Other comments from SmartLife stakeholders highlighted the importance of building to learn:

> While many startups spend months developing a comprehensive strategy, plan, and product to achieve post-revenue status, SmartLife was post-revenue in days when the pop-up shop sold 500L of water. It was adopting this spirit of … building to learn that has been most crucial to quickly making SmartLife real in a more permanent way. (IDEO.org, 2014b)

> Most importantly, these decisions of priority ultimately allowed us to quickly push forward on defining the best ways to execute the newest and hardest aspects of the model—delivering a high-touch subscription and delivery service in an area where people aren't accustomed to subscriptions, quality service, or reliable delivery—and that agility earned from building to learn is what ultimately put the Rongai store on the map by February. (IDEO.org, 2014b)

In 2014, David Aycan (former Design Director and Business Design Discipline Lead at IDEO) and Paolo Lorenzoni (former Business Designer and Project Lead at IDEO) renamed what Patrice Martin (Creative Director of IDEO.org) had called "betatyping" as "live prototyping" (Aycan & Lorenzoni, 2014). Live prototyping is in between rapid prototyping and technical prototyping or piloting (see Table 7.2). The purpose of live prototyping is "to explore the customer value proposition and market appeal of a concept in the more turbulent and distracting context of the live market, but without full investment in a pilot" (Aycan & Lorenzoni, 2014). Instead of conducting surveys and focus groups, live prototyping puts rough concepts into contexts in which consumers will encounter them in their daily routine (Aycan & Lorenzoni, 2014).

The prototyping conducted by the SmartLife team exhibited several of the hallmark characteristics of live prototyping. "Since live prototyping usually addresses the resonance of a value proposition in context, we generally invest more on the fidelity of initial packaging and associated marketing materials, and less on the features that deliver value over time" (Aycan & Lorenzoni, 2014). For the SmartLife prototype, the team created branded brochures, business cards, sales tags, store signboards, water containers, and uniforms. The team rented an existing kiosk and mobile sales cart and hired translators to role-play as SmartLife employees. The branding and interactions with sales representatives were credible enough to convince customers that SmartLife was a real business. By investing in only enough fidelity to appear credible, live prototyping conserves capital by cutting corners relative to a full pilot (Aycan & Lorenzoni, 2014). A disadvantage of the fast timeframe of live prototyping is that this could not provide

longitudinal feedback, such as evaluating retention and engagement over time (Aycan & Lorenzoni, 2014).

Table 7.2. A guide to prototyping (Aycan & Lorenzoni, 2014)

	RAPID PROTOTYPING	LIVE PROTOTYPING	TECHNICAL PROTOTYPING	PILOT
Question answered	What are the different ways we could solve this problem?	Does our message and solution resonate in the market?	Can the problem be solved in this specific way?	Are the economics attractive enough to justify scaling?
When to employ it in the product-development process	Early, to explore many ways to achieve a goal and periodically during the mid-phase to explore ways to deliver a specific feature or value driver.	Midway, to rigorously explore market appeal once a specific opportunity area has been identified.	When technical feasibility is in question or when the function has been identified but the specific means is yet to be determined.	Late, as a final check to tweak details before launching at scale.
Fidelity (i.e. the degree to which a prototype reflects a polished and finished product)	Low	Just enough for the product to appear real in the marketplace.	High enough to prove feasibility.	Very high. Pilots require a working solution and are often more polished than the scalable versions to overcome initial market awareness challenges.

One advantage of live prototyping is that it occurs in context, and increases "understanding of how environmental and situational factors affect the appeal or visibility of a solution" (Aycan & Lorenzoni, 2014). The SmartLife team tested several sales channels, including a door-to-door salesperson, mobile sales cart, and kiosk. "It was a combination of retail locations, delivery, and door-to-door that solidified the customers' confidence" (Bigio et al., 2012, p. 20). There were serendipitous reinforcing interactions between the touch points. The door-to-door salesperson and mobile sales cart raised awareness and directed new customers to the kiosk. The kiosk was a physical location that created a sense of permanence and increased credibility. Each of the touch points also provided a unique benefit. The door-to-door salesperson provided a personal overview of the service and enabled customers to try new products in the privacy of their homes. The mobile sales cart resembled the traditional mkokoteni water carts that commonly sell non-potable water in the streets of Nairobi. They were familiar and could provide water on-demand. The kiosk was located at a high-traffic bus stop and drew a crowd of people who were passing by. For the SmartLife pilot, the kiosk also enabled people to see the water purification and container cleaning processes, further increasing credibility. If the team had conducted surveys or focus groups instead of live prototyping, they may not have discovered that the combination of touch points enhanced access and credibility.

Live prototyping provides qualitative and quantitative feedback (Aycan & Lorenzoni, 2014). Design teams may start by observing consumers reacting naturally to the live prototype before conducting interviews to probe more deeply (Aycan & Lorenzoni, 2014). Design teams may also collect quantitative data on the live prototyping experience to complement the qualitative data from observations and interviews (Aycan & Lorenzoni, 2014). The SmartLife

team discreetly observed customer behavior at the kiosks, at the mobile sales and delivery carts, and at households. They later interviewed customers about their experience to better understand their behavior and choices.

Live prototyping improves forecasting and enables us to observe what people actually do rather than what they say they will do (Aycan & Lorenzoni, 2014). SmartLife successfully sold water alongside nutrition and hygiene products, in the context of competitors. There are alternate methods to estimate willingness to pay, but live prototyping offered a more personal way to assess the potential of the business model. The clients were able to see the excitement of people buying water and health products firsthand. "Ultimately, by testing more ideas in market, with lower investment, and only piloting the most promising ideas, a company can radically improve its return on invested capital for new products and experiences" (Aycan & Lorenzoni, 2014).

IDEO.org's use of live prototyping strategies seems to have emerged organically from having a small budget, short timelines, and many design constraints:

> We have much smaller budgets. We have shorter timelines. We have to be a lot more scrappy. I think that designers love working within constraints, and we have a lot of constraints. We've had to be more innovative and scrappy than some teams at IDEO, for sure. That's furthered our process and I think pushed us to better work. I think long before we understood what live prototyping was, before there was a word for that, we were forced to do that in the field. We had to test if the subscription service was going to work, that was the only way to figure it out. And we had to iterate in the moment and figure out if this was going to be a viable option for our partner. So I think there's a lot more of that. We have less time to get analogous research or interview experts or go on different fun experiences that might inform our work, like analogous research experiences. But somehow [with] our timelines, we make it work. — IDEO.org Staff (S16)

Zimba's Prototyping Strategy:

Zimba's inventor primarily worked on the design and prototyping of the chlorine dispenser in his home in Kolkata, India. With limited funds, he set up a makeshift workshop. Each prototype was made by hand using fiberglass, basic tools, glue, plastic sheets and tubes. If Zimba's inventor had had access to rapid prototyping facilities, perhaps he could have achieved the required accuracy and reliability more quickly or easily.

Some of the delays in the Zimba team's ability to progress were due to the requirements and protocols of academic and research institutions. The National Collegiate Inventors and Innovators' Alliance (NCIIA) awarded the Zimba team a $20,000 research grant, which was administered through UC Berkeley's Mechanical Engineering Department. However, this department did not have established protocols for financially managing projects in emerging regions. The inventor of Zimba was a citizen of India, and there were no pre-established protocols for paying stipends to non-US citizens or reimbursing purchases made overseas without formal receipts. Restricted access to funds meant that Zimba's inventor sometimes faced difficulties or delays paying for prototyping or field-testing expenses. After several months of processing paperwork and delayed payments, the Zimba team transferred the administration of the grant to the Massachusetts Institute of Technology, where there were established and streamlined protocols for managing projects in emerging regions.

Unlike social enterprises or informal inventors, researchers associated with academic institutions must submit protocols for human subjects research for review by an Institutional Review Board (IRB). IRB review is important for the protection of human subjects and ethical conduct of research. While Zimba's grant funding was administered through UC Berkeley, the Zimba team underwent an IRB review process, which delayed their pilot by several months. In

contrast, the SmartLife team did not undergo a similar IRB review process because the focus of their endeavor was launching an enterprise, not academic research.

In addition to delays associated with academic and research requirements, the Zimba team debated internally about whether the chlorine dispensers were ready to market. Some team members preferred to field test and learn early and often, whereas other team members preferred to test rigorously in a lab to ensure that the technology was reliable before field-testing:

> You can say, "Okay, we are going to do a bunch of prototypes and throw them out to the field as soon as possible, learn from those, see what works and what doesn't work, and go forward with that." Or we can say, "We are going to test a design very excessively in the lab setting and make sure this is working really well. And no harmful side effects of this or anything like that, really make sure that we are really confident in this design before putting it out in the field before we do that." […] Those would be the two ends of the spectrum that people on the team fell on. And that affected our implementation strategies and design strategies and going forward strategies. — Zimba Team Member (S6)

> There was this pushing forward and pulling back, and pushing forward and pulling back that kept happening. […] We did that study with ICDDR,B [International Center for Diarrheal Disease Research in Bangladesh]. […] They showed that our chlorine doser was rated very favorably by their study compared to the other ones that didn't particularly work (to my recollection of that study). But the members on our team were still hesitant and said that, "Even though people liked it in this study, we are still at the very early stage of the prototype. We are still not ready to take this to the market yet." There was a lot of that concern or hesitancy to commit to standing by the product. […] I don't know exactly what that was caused by. I sensed that in our team a lot. I think it might have been a lack of familiarity with what the team was going through necessarily. We have people who really haven't been to all these meetings and wanted to know what exactly was happening before comfortably saying, "Hey, we are going to forward with this or not." — Zimba Team Member (S6)

> I think at some point we became preoccupied trying to solve everything at once, instead of trying to make our product, sell it, distribute it, and then iteratively improve it and try to address these conditions that we came up with then. — Zimba Team Member (S6)

It is interesting to note that prototyping in developing country contexts led to bolder and more rapid prototyping with SmartLife, but resulted in a more conservative approach and a longer timeline with Zimba. The less regulated environment in developing countries created a more liberal setting that facilitated SmartLife's live prototyping activities, in which they were able to test customers' receptivity to new products and services by setting up a temporary business. In contrast, Zimba faced logistical challenges and delays since their funding was administered through an university department that was unaccustomed to processing purchases and contracts in developing countries. Zimba also underwent a more stringent review process to ensure the protection of human subjects for research conducted with vulnerable populations in a developing country.

Implementation Strategies

The implementation strategies of SmartLife and Zimba appear to be influenced by differences in IDEO.org's Project-Based Consulting Model and IDDS's Creative Capacity Building Model. With IDEO.org's Project-Based Consulting Model, implementing partners are a core part of the process from the beginning. IDEO.org works with partners to identify potential projects and refine the problem framing and scope to align with their priorities and existing structures. Partners are involved throughout the design process to ensure that there is buy-in. IDEO.org's design teams also invest significant time and resources to develop comprehensive

implementation plans to support partners in launching and managing the resulting products and services.

In contrast, IDDS's Creative Capacity Building Model is focused on supporting IDDS participants in becoming inventors and launching social enterprises. IDDS does not form partnerships with implementing organizations since they believe that the autonomy of the design team is critical for learning and personal transformation. After IDDS, it is hoped that some participants will launch social enterprises. Participants also have the option of partnering with implementation organizations. What follows is an overview of the implementation strategies of SmartLife and Zimba.

SmartLife's Implementation Strategy

IDEO.org selectively chooses to partner with client organizations that have sector expertise, a demonstrated ability to implement at scale, and access to funding. The client organizations for SmartLife (WSUP, Unilever, and GAIN) have expertise in providing clean water, hygiene products, and nutritional supplements. These multinational organizations also have years of experience implementing large-scale programs in multiple countries. Furthermore, they had the resources to pay a fee-for-service to IDEO.org to design the SmartLife business, and the ability to obtain funding to launch a pilot. These clients were also familiar with the design thinking process and trusted IDEO.org. IDEO.org had previously worked with Unilever and WSUP on the Clean Team in-home sanitation service in Kumasi, Ghana and demonstrated that they were ready and able to implement. As of 2014, the Clean Team venture was serving 428 families (IDEO.org, 2015e). On the other hand, even with the best partners might also impose constraints that are counterproductive:

> Because of the partner organization, the clients also impose constraints on the project that are counterproductive to the ultimate goal of the project, like the fact that Unilever was a partner that needed to sell consumer goods. There were some interesting learnings in terms of creating a brand that sold [goods], but actually, it was pretty obvious that that part of the offering was irrelevant to the business and we shoe-horned it in there because it was a requirement. — SmartLife Designer (S21)

As consultants, it was important for the IDEO.org design team to involve clients in the design process, and to develop a solution that would meet their business and social impact goals (S17):

> Unilever was dead set that they wanted a door-to-door business coming out of this. They thought a lot of this was to figure out how to do that. WSUP was like, "No, the kiosk model is working great for us. Let's figure out how to do that." They all had these very clear things that they wanted in addition to this larger idea of this business.
>
> The process of bringing [the clients] into the interviews, pulling out the rigorous data from the interviews, doing the prototyping, and packaging all of that with them, helped them come along to see our way of thinking. I think of [a SmartLife Designer's] crazy Trojan horse diagram [see Figure 7.5], which we joked about but actually is one that they talk about the most in really interesting ways. […] And some of it was about this ability to package this thing in a way that got them to shift their thinking and think about how to operate this business in new way that hit their ultimate aims in terms of both from a business standpoint and a social impact standpoint. — SmartLife Designer (S17)
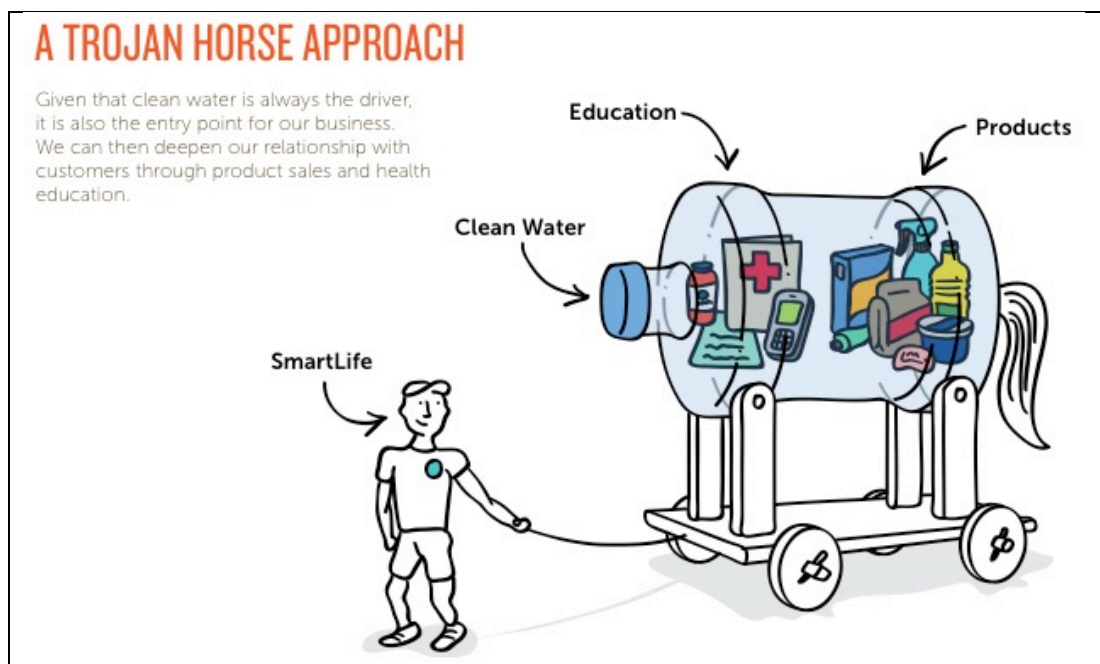
Figure 7.5. The SmartLife Trojan horse diagram (Robin Bigio et al. 2012, p.25)

In addition to developing a promising concept, it was critically important that the SmartLife team could package and communicate it in a way that their clients could embrace and implement:

> The thing actually that I'd say I did take away from my IDEO.org experience is how this stuff is packaged and how it is communicated. The ability, beyond the validity of the data you found itself… The way in which you choose to communicate that data has a tremendous amount of power. — SmartLife Designer (S17)

Zimba's Implementation Strategy

In the case of the Zimba project, the inventor wanted to maintain autonomy and ownership of the intellectual property associated with the Zimba chlorine dispenser. However, realizing the inventor's vision of serving remote villages requires a chain of support to maintain and refill the chlorine dispenser (Zimba Team Member, S5). Since the Zimba team could not provide the support needed, they tried to partner with established organizations:

> We tried to be very thoughtful about our partnerships and make sure that the organization that is trying to buy our dosers or is helping disseminate our dosers has a very similar mission that we believe in and that is going to take care of people and have a sustainable model for creating an impact through Zimba. But at some point, we realized that we did not have the capacity to provide the whole chain of support because we just need too much infrastructure, and we do not have that infrastructure with our team. We don't think there was much value in trying to recreate that infrastructure just for this. So we are trying to make sure that the partnering organizations would have a sufficient level of infrastructure already. — Zimba Team Member (S6)

The Zimba team has had difficulty finding suitable partners. Since the chlorine dispensers are expensive to transport, the Zimba team has decided to only partner with organizations working near Kolkata, India where the inventor hand-makes the Zimba chlorine dispensers. The

inventor "received regular requests from organizations that wanted to try Zimba [chlorine dispensers] in Africa, but he believed that without local manufacturing capacity in Africa the shipping costs to the continent would make these sales unviable" (Hess, 2014). According to one team member, "there's a group in Uganda that was interested, but it's really hard for [Zimba's inventor] to get [chlorine dispensers] to them and check it out if anything goes wrong. […] We didn't have funds to fly [Zimba inventor] there to maintain and monitor and help out" (S5). Another team member notes, "If someone wants to buy our product but they are not going to provide maintenance for it and doesn't have a good maintenance plan for it, Zimba has refused to partner with the organizations like that before. We didn't want our product somewhere not working and not doing what is supposed to be doing" (S6).

A Zimba team member summarizes some additional challenges with finding partner organizations: "There's a mix between organizations changing, funding sources changing, staff changing, programs changing, and some of the groups initially interested in funding it out of pilot stage may not be the appropriate funder in a long-term" (S5). For example, an NGO piloted ten chlorine dispensers, "but then over time, the funding changed and their entire team changed (the staff that we were in contact with have left)" (S5). A social enterprise also piloted the chlorine dispenser, but realized using the Zimba chlorine dispenser was less profitable than having micro-franchisees manually chlorinate large tanks of water (Hess, 2014; Zimba Team Member, S5). Another group was "strictly a research organization, and they were piloting Zimba [chlorine dispensers] from the research stand-point" without any interest in dissemination at scale (S5). "We even thought about talking to government […], but the politics are slow" (S5). Reflecting upon the challenges of selecting appropriate partners, a Zimba team member pondered whether the team could have been more selective:

> We went through this phase where we were trying to work with literally anyone who's wiling to work with us. And it actually takes a lot of time to do, so it's hard to do well. And maybe rather than going to the first five groups or organizations that wanted to pilot Zimba, we could have thought more carefully about where does it make sense, where they might actually become our long-term customer or partner or supporter, and maybe waited to seek those people out, versus working with...
> We thought we were actually thinking more along those lines, strategically when we made these agreements. But yeah, just in retrospect, for the amount that didn't continue, it's like maybe all those decisions should've been made more carefully, and we could have been more selective. Who knows?
> They also brought really needed funding and support at the time for the individual pilots that maybe we wouldn't have survived if we simply waited for the right partners, so I don't know. — Zimba Team Member (S5)

> I wish we had a more formal process, but a lot of it was talking through like the way they're structured; does it actually make sense? Because some groups who talked to us were… They might not fully understand what Zimba is, and its capability as well as its limitations, because it does need someone able to refill chlorine. So do they have that? People who can support in that way? Are they structured in the way that they might actually be able to continue working with Zimba down the line? […]
> Values were pretty important to ask, but it's one of those things that are like we very rarely met somebody in the water sector who wasn't like, "Yeah, actually we ultimately care about the people having access to clean drinking water." But if anybody seems more interested in the ability to get international funds, or some other things, then that raised a red flag. Their values didn't match this, why they wanted to do this, but most people we were talking about who are actually working on the water program actually wanted that community to have more access to drinking water. So there's a line there, maybe. I guess those are some of the criteria we looked at. In some cases we even considered how long have they been working in the community. What's the level of trust? Because that was something that we had hoped that our partner organizations could bring if we are installing in one of the communities they know, and not the ones we know. — Zimba Team Member (S5)

Due to difficulties in finding appropriate implementation partners, the Zimba team is experimenting with other business models:

> "Can we actually rather than sell to organizations, sell to people in the community?" Because you hear of water businesses that are able to collect small amounts of payment for treated water. Inspired by that, now we are running two pilots […] with micro-entrepreneurs in communities. The idea is that these micro-entrepreneurs would be supported by Zimba in terms of the technical side of maintaining the Zimba device as a community. And the idea is each one would actually operate five Zimbas that are close enough that they can go and collect payments on regular basis, and really easily be able to go fill up the chlorine and do maintenance if necessary. The income coming from there is not huge because we are not going to charge a huge amount of funds for water, so it's a supplementary income source. For these micro-entrepreneurs, this might not be their only job, for example. — Zimba Team Member (S5)

There are advantages and disadvantages associated with partnering with implementation organizations. Partner organizations may provide access to funding, credibility, and infrastructure for rapid implementation. However, as the SmartLife case demonstrates, partners also impose constraints upon the project, some of which may be counterproductive to the ultimate goals. On the other hand, if a technology is developed independently from a dissemination model, it may be difficult to develop partnerships or a business model afterwards. As the Zimba case demonstrates, there may be difficulties in identifying appropriate partners or internal organizational changes that make the partnership no longer a good fit. Especially for technologies that require infrastructure for deployment and maintenance, it may be best to develop the technology in conjunction with the business or dissemination model. Learning from examples such as the Zimba project, IDDS began to integrate technology and business development from 2011 onwards.

Thus, the two organizations approached prototyping and implementation in different ways. Both organizations embedded prototyping in the process quite early, before engaging in the Understanding Phase of the process. IDEO.org, however, prototyped to learn about what potential consumers liked and did not like about a service, while Zimba prototyped to test and iterate on the design of the technology. Finally, implementation was quite different for the two organizations as IDEO.org was set up early with partners who could take the solution through to implementation, whereas Zimba tried to find partners later in the process.

7.5.2 The Design Team

Design teams are a Key Resource in HCD for Social Impact programs. As a Key Resource, the profile of the design team must align with the other building blocks of a program's social blueprint. (See the Social Blueprint description in Chapter 3 for a definition of Key Resource and how it fits in the Social Blueprint.)

IDEO.org forms design teams with the goal of achieving measurable impact through HCD projects. IDEO.org employs "top-notch designers, an elite class of businesspeople, and development experts" (IDEO.org, 2014a). The IDEO.org SmartLife design team included a Senior Industrial Designer from IDEO as the Project Lead, and three Fellows (a Business Designer, an Environments Designer, and a Mechanical Engineer). A representative from each of the three client organizations worked with the IDEO.org design team and also participated in field research in Kenya. The clients had years of experience and expertise in developing and launching water enterprises in developing countries. These teams of experts were full-time salaried employees with a project budget on the order of a hundred thousand dollars to complete

an eight-week design project (CGAP & IDEO.org, 2014). The budget for launching the SmartLife pilot was between $30,000 and $100,000 (IDEO.org, 2014b).

In comparison, the Key Resources building block of IDDS's Social Blueprint is geared towards creating a global network of social innovators and building capacity for technology creation, and so contains instructors and design facilitators for IDDS's design process. IDDS targets people who do not identify as innovators and empowers them to believe that they can innovate and that they can have social impact (Smith, 2015a). IDDS's mission requires that they place people on their design teams who have little or no experience in design, entrepreneurship, and/or international development. Recruiting design team members with significant experience and expertise in designing and launching products and businesses for poverty alleviation would have defeated the purpose of IDDS's capacity building mission. Instead, IDDS instructors and design facilitators bring those skills to bear in guiding design teams. The way in which the IDDS program constructs its design teams, is beneficial for achieving their design education goal, but creates challenges towards achieving their design practice goal of designing scalable technologies for poverty alleviation. This section summarizes some of the challenges encountered.

Geographic dispersion:

When IDDS forms teams, they heavily consider individual preferences because they believe autonomy is important for motivation and a sustained engagement in social innovation (IDDS Faculty, S2). IDDS also believes that diversity is critical for innovation, and stimulates "mental shifts and emotional shifts and equality in the world" (IDIN Staff, S11). The resulting design teams sometimes included members speaking different languages and from different regions of the world. While such diverse teams may work well together at the IDDS conference, afterwards when team members and prototypes are located across multiple time zones, it can be difficult to communicate and collaborate. The IDDS 2009 Chlorine Dispenser team (later re-named Zimba) included engineers from India, Ghana, Guatemala, and the U.S (Das, Deku, Harper, Sanchez, & Stupin, 2009). The IDDS 2010 Zimba team included engineers from India, the U.S., and Pakistan, as well as a pastor from Zambia (Zimba Team Member, S4). At various times, the Zimba team also included industrial designers from England and Guatemala, and business and engineering students from MIT and UC Berkeley.

A Zimba team member commented upon how bringing people together from all over the world is beneficial during the IDDS conference, but can be challenging for project continuity after IDDS:

> The wonderful thing and the challenging thing about IDDS is that it brings together people from all over the world. While you are in the same place, it is awesome. You are learning things. Everyone is bringing things that they know from their context and building off of that. Then, you go home and your team is in five different countries and five different time zones. We have struggled with all being on Skype. That's why being able to be there in person whether in IDDS, whether in Kolkata or in Bangladesh [at a pilot site] has been really good. When people got to go out there, we made a lot of progress. Then, you feel more connected to the project. But that is costly and some people aren't able to do that all the time. So I guess that is something intrinsic in IDDS. It is a great thing and a challenge in terms of [project] continuity and the follow-up. — Zimba Team Member (S4)

The inventor worked on most of the technical design and prototyping at his home in Kolkata, India, but most Zimba team members could not relocate permanently or travel frequently. Not

having team members on the ground meant that Zimba's inventor was essentially a "lone innovator" at times (S4):

> [Zimba's inventor] is still working a lot on Zimba and doing a lot of stuff but it is hard for him to work without support. […] When you are sitting in lab with two or three people and you are trying to figure out how to design this thing and make it better, there is this energetic atmosphere that IDDS had created where everyone is constantly working with high energy and enough resources to do prototyping. Then you feel empowered to work on it and this [intoxicating feeling] of everyone working together makes you want to work more.
>
> When you are working on something by yourself, it is hard to motivate yourself to do that work when you have a lot of other stuff going on. Like stay up until midnight trying to figure out something you are not sure you will able to figure out all by yourself. And if you're hitting the wall with your ideas because there is no one to bounce other ideas off of. I don't think design by yourself is particularly easier or a good way of doing design. Design teams are definitely better than individuals and I think that we have a lot of that happening with Zimba. I can only imagine what [Zimba's inventor] is going through on his side of things where sometimes he feels like he has support and sometimes he feels like he does not have support. — Zimba Team Member (S6)

> We always struggled with getting [Zimba chlorine dispensers] beyond the prototypes and out to more people. Part of it is the team. We have not been able to support [Zimba's inventor] at all in the last couple of years. He has been more the *lone innovator*. I mean he has [a volunteer] helping him in India, but I think if someone could have moved out there for a year. I think he likes working as a team. He likes being with people. And you get a lot of done when you have fresh people and bouncing ideas off of each other. — Zimba Team Member (S4)

The Zimba team remained committed to the project and one another:

> [Zimba's inventor] has this vision of making the treated water more accessible, and being inspired by how we get our water automatically-chlorinated here in the U.S. […]. [Zimba's inventor's] passion and belief that this is something that he's willing to put everything he's got into. And moving forward, to try to be one of the options that can help in the space. […] I just wanted to support that, the dream of [Zimba's inventor] is very worthwhile, even though I know that Zimba is facing some challenges and hasn't been as effective as it could be. — Zimba Team Member (S5)

> It's definitely a product and a cause that I believe in. And so I care about the people working on the project. And I care about the project and the success of the project so I am happy to put in the time to see it succeed. […] Some of the problems it was dealing with I thought was interesting design or engineering problems so that was also fun for a while. […]
>
> The people working on the team are also super close to each other. I am really good friends with every single one on the Zimba team. When you are working on a project with people who you like, you want to work on the project together because it's a positive and fun working environment. I think maybe [Zimba inventor's] energy, enthusiasm, and willingness to champion the project and the strength of the individual connections between the team members [motivates team members to continue]. — Zimba Team Member (S6)

However, being geographically distant made it challenging to keep abreast of the status and needs of the project:

> It's really slow, because [Zimba's inventor] would have to draw out schematics […] to send to those remote teams by email, and the remote team would comment, but it would take time because everyone's so busy. Stuff is much slower. — Zimba Team Member (S5)

> There was a bigger picture we wanted to accomplish, but it's hard to do that when we are trying to work remotely. You are willing to put in time, but it's just hard to figure out what exactly needs to be done at

certain times. […] A lot of technical innovation that happened with Zimba was probably when [two Zimba team members] went to India and worked side by side with [Zimba's inventor] for a month. I think that was probably the most productive period of time for Zimba, when people were in the field. — Zimba Team Member (S6)

<u>Lack of clear roles and time commitments</u>

There were also challenges associated with having a team composed primarily of part-time volunteers. Since IDDS aims to inspire people to dedicate their lives to social innovation, students are understandably a target group. As undergraduates, students are typically in the process of exploring potential career paths and experiencing a period of personal growth. An IDDS experience during this period could shift their field of study or career path. About half of IDDS participants are students (IDDS, 2010). Most of the original Zimba team members were studying at or employed by universities. Zimba recruited new team members but most were also students, since a significant portion of the team's social network was associated with universities. Some of the funding opportunities Zimba applied for also required student team members for eligibility. Managing a team of part-time volunteers can be difficult due to the lack of clear roles or well-defined commitments. A Zimba team member elaborates:

> We had a lot of team members with a very limited time. […] We haven't said, "This is what I'm available to do, and this is how much time I can put in." […] [Zimba's inventor] would send emails to everyone in Zimba (who worked on and off) without a certain idea of what our capacity to work actually was, who was really working on this, and how many hours are we putting in. […] People were able to put like up to five hours a week, but maybe closer to one hour a week. […] There are certain things that needed a large time investment and a structure to be able to keep working on it. And I think we didn't do a good job addressing some of those issues. — Zimba Team Member (S6)

> I think that the problem was that when people joined the team, they worked on something that we needed at that time. And it made sense for them to join the team. But […] there has never been a clear idea of who is working on Zimba right now. I don't think we ever knew that. […] So [Zimba's inventor] would send emails to everyone in Zimba who worked on and off without a certain idea of what our capacity to work actually was, who was really working on this, and how many hours are we putting in. — Zimba Team Member (S6)

The Zimba design team has a relatively flat hierarchical structure, with all members having equal power in decision-making with the exception of the inventor. The inventor of Zimba has more decision-making power than other members since he is the project champion who will continue to take the project forward. However, the inventor prefers not to make unilateral decisions, and the Zimba team has a tendency to include all team members in most decisions. Especially with difficulties scheduling across multiple time zones, there was typically at least one person missing from each Skype conference call. These absences resulted in information being repeated or decisions being questioned and re-discussed when previously absent team members rejoined. A Zimba team member elaborates about how the lack of a clear decision-making structure can lead to stagnation in project progress:

> There was no clear decision-making structure. […] We were trying to do this more consensus-based decision-making for a lot of things. […] I feel like consensus-based decision-making works great when everyone is fully on and fully active. But if you have someone who is showing up to one meeting, and they want to put their seal of approval on this thing, but they don't know what's happened in the past month in the project that could have changed, and you need to spend a lot of time and resources catching one person

up, getting them to agree with going forward, that slows down the process significantly. — Zimba Team Member (S6)

A lot of design work turned into discussions about, "Do we go to this direction or do we go to this direction?" Which when you have a lot of discussions and not enough hands-on work to validate those decisions through experiments or designs, people started to stagnate, working and not making progress, and you tend to stop putting time into it. — Zimba Team Member (S6)

Formalizing roles and developing a clear decision-making structure would have helped to manage some of the challenges:

It is important how you manage inter-team communication. That is critical, and the roles in the team, and that everyone has a meaningful role. One of the biggest lessons I learned […] was that every person has ownership over what they are doing and they can do that independently, and they can also collaborate on their component with other people. So that you don't always feel like you have to always work with other people to get something done, but you also don't feel like you have to do anything by yourself. It gives people the freedom to make design decisions and be like, "Hey, you are in charge of this portion of this and you have the final say over this." Making people empowered to do something is definitely an easier way of doing it. And just having a team that you trust to make those good decisions is really important.

In Zimba, we did not really have a final say. There was no one person who was going to be responsible for aesthetic design. And everyone would try to see what this person has done, and get others' inputs. And then, we would say that this is how we are making decisions moving forward. And just not having a structure like that in place makes it so that you don't really know how you are contributing necessarily to a project going forward because you don't know who is making decisions, how they are being made, and there are arbitrary decisions being made. It is like everyone working together and trying to make this as good as we can, but that form of structure is not enough. […]

I think that the team needs to have a sense of empowerment to be able to make decisions and be able to know that the work they are putting in is impacting something and that they feel like they are not just doing work for the sake of doing the work and the work that they are doing is making it into the final project. As you can create the sense of everyone knows what they are doing and what they are working on and the sense that people feel like their work is useful and is being utilized. I cannot think of specific roles but sort of the energy and the positivity of the people in relation to their projects. — Zimba Team Member (S6)

Missing skill-sets:

The Zimba project was introduced at IDDS in 2009 when IDDS was primarily focusing on the development of technologists and technologies. As a result, the IDDS Zimba team was initially composed mostly of technologists:

A lot of start-ups are very conscious in, "Okay, we have someone to help the technology, to lead the business development and all of this." We might not have been that thoughtful in it. We are very much like, "Oh, we are passionate about trying to make this happen. And, let's work with whoever is willing to work with us." So the team initially was pretty heavy on more technologist side. I guess so many people were more interested in design, and we come from IDDS, which is about technologists, not technologies, so we are very interested in technology design, so we probably started more heavily leaning towards that side. — Zimba Team Member (S5)

The lack of a businessperson on the team meant that Zimba initially focused mainly on technology development:

Initially, we didn't have any core members who are dedicated to pushing forward thinking around what's the business model that makes most sense. We really focus on the technology development. We tried to

bring in more thinking around the business model over time, but it probably hasn't influenced the technology design as much as it could have, simply because there wasn't a core business member the whole time. — Zimba Team Member (S5)

Recognizing that teams needed more support in business development, the IDDS in 2012 in Colorado focused on the development of prototypes to products, and projects to ventures:

> [IDDS] attracts a lot of people who want to do the hands-on stuff and sometimes doing one means that you might not be interested in the other. If you look at the success stories, a lot of them are really innovative in their business models and approach. So there is a lot of problem solving there, but less compelling for people who want to build things. It is a similar type of person who comes to IDDS. Maybe that does not seem as cool to IDDS either. All the cool stuff is with the inventions versus having cases of like, "Isn't it so cool that they sold this through these means?" I know we are trying to have more of that. After Colorado, it became more like needing a separate IDDS, who will teach both at the same, like have people thinking about the venture as they think about the product, which makes a lot of sense. — Zimba Team Member (S4)

The Zimba team is in the process of developing a viable business model. In addition, the Zimba team is exploring processes for manufacturing at scale to decrease per unit cost and improve quality, but the Zimba team also lacks the skills and capacity to do so:

> Each Zimba cost approximately $100 to manufacture over a period of 1.5 days. […] Students in the MIT D-Lab course 'Design for Scale' recommended that [Zimba's inventor] explore thermoforming the fiberglass Zimba components. […] However, to do so properly would require that [Zimba's inventor] or the volunteers assisting him perform fluid dynamics modeling. At the time, [Zimba's inventor] and his team did not have the capacity to take on this task. — (Hess, 2014, p. 3-4)

Financial limitations:

A lack of funding significantly impeded progress for the Zimba project. The Zimba team received less than $500 for prototyping during the IDDS 2009 conference. Afterwards, Zimba team members spent significant time applying for funding to continue the research and development of the chlorine dispenser. Zimba team members commented on how funding would have enabled both engineering and business development:

> Zimba, as a team, we spent so much time trying to find money that it made it hard to do actual work. Every time a grant comes up, I only have time to either do engineering work or the grant writing. If we don't have the funding to do the engineering work, I need to focus on grant writing. — Zimba Team Member (S6)

> We have also struggled to get the right amount of money. We applied to tons of grants, and become finalists but then we don't quite get the grant. […] [Zimba's inventor] tried to do the things he could with what he had, which was smaller things versus "Like yeah, we can do the tooling for this bigger thing. Now we can make a lot of this at once," versus only having the capital to make only a small amount at a time. — Zimba Team Member (S4)

> We want to do a business pilot for Zimba. We are looking at around $50,000 to $100,000. […] We wanted to be able to partner with an organization and put some Zimba dosers out in the field and have people check up on them, and try to build a business model where people in the communities were paying to maintain their Zimba dosers, and test the model. If that business model worked, we would have learned a lot, and we could have tried to scale up in that direction. But if that business model did not work, then we would have tried a new business model. But we need some money to put together that pilot to know which direction we should go in. — Zimba Team Member (S6)

Another Zimba team member noted that training on monitoring and evaluation would have been helpful in producing evidence of effectiveness and securing additional funding for development:

> We talked to some pretty big people. We don't have enough evidence to show them, to convince them to buy a hundred of these [Zimba chlorine dispensers]. — Zimba Team Member (S4)

> At IDDS itself, […] I don't know if we ever talk about the theory of change or how to evaluate success. […] At the panel yesterday on impact investing, there are things that people want to see before they are willing to throw in this amount of money. […] In recent years, we have talked about how we could use sensors — there are a lot of interesting things you can do by tracking usage rather than hanging out by the thing and watching people, which used to be the alternative. […] It just falls off when there's other stuff. Unless someone is saying that we really want to know this, then it is something that won't necessarily be emphasized. I would say in terms of even knowing what we want to be measuring, there is less guidance on that. — Zimba Team Member (S4)

> I wish I was living there and really could see how often community members use it, but when we go, we hear that people use it. We need to monitor this better just to learn that this is doing everything it can be and the ways we could make it better. […] Some community members really seem, well, they seem to care about clean water access and would express that this is something that matters to them in the way that made us want to keep going. But I don't know if it's just because we were there and saying these things. We would even hear things like, "Oh yeah, this chlorinate water is great. My knee feels better." And that looks like... "Wait, that's actually not possible to be better, but it's great that you are appreciative and happy with this." Or maybe you are just trying to make us feel better. So that's why I say that I am not quite sure about the community piece. I definitely feel motivated when I go, but I don't know if Zimba is making the impact we would have hoped because we just can't see it. — Zimba Team Member (S5)

The Zimba team received less than $50,000 from a combination of $30 to $2000 IDDS microgrants, a $20,000 IDIN Scale-Up Fellowship, and a $20,000 grant from the National Collegiate Inventors and Innovators Alliance. IDIN awards microgrants for prototyping, but this funding cannot be used towards stipends or people since IDIN has limited funding (IDIN Staff, S1). IDIN's Scale-Up Fellowship paid the founder of Zimba a $10,000 stipend for one year (Zimba Team Member, S5). With a limited budget, most of the Zimba team consisted of students or recent graduates who did not have professional design experience, and were volunteering part-time to work on the project. It is difficult for people to work on projects full-time without financial support for salaries and stipends:

> People are generally able to fund the direct project cost […], but funding people has been a lot harder. We found some opportunities, but usually they don't cover the entire time, like they cover the part-time or a piece of it. […] It just remains the hard area for entrepreneurs, at least from my experience talking to [Zimba Founder], funding your time so that you can be sustainable and dedicated full-time, especially if you have a family. It's harder to take risks. — Zimba Team Member (S5)

Moreover, a major barrier towards Zimba's ability to scale up is the lack of a business model, and lack of funding has been identified as the reason for not being able to recruit a dedicated businessperson (S6):

> It would be great to have a recent graduate, brilliant with energy and passion around this who can contribute a lot to move the team forward. But we didn't have the money to pay them, or if we did, we would have only very little and only for a short period of time like for six months or something, depending on when the grant would run out, and that wasn't enough to recruit somebody. We actually tried a couple of times. — Zimba Team Member (S5)

The section highlighted some of the challenges encountered by the Zimba design team as they tried to launch a product in a system geared towards building capacity. The comparison of Zimba with SmartLife helped to identify issues that were particularly challenging for Zimba. For example, SmartLife had the advantage of several full-time salaried and experienced professionals working with established organizations with proven success. Zimba's design team consisted mostly of part-time student volunteers or recent graduates who had limited or no experience launching a product or business. Zimba's team was also geographically dispersed and lacked a clear decision-making structure. Learning from the experience of projects such as Zimba, IDDS has made significant changes to their program and developed additional programs and resources.

It is beyond the scope of this research study to analyze the influences of the design team on the outcomes of the design project. There are too many confounding differences between these two project case studies to isolate the influence of the design team. For example, SmartLife had approximately an order of magnitude more resources than Zimba. IDEO.org projects receive on the order of hundreds of thousands of dollars, whereas IDDS projects receive on the order of tens of thousands of dollars. In addition, SmartLife was focused on designing a business using existing technologies, whereas Zimba was designing a new technology as well as business to disseminate it. This section concludes my qualitative analysis of interview data about the SmartLife and Zimba project case studies.

In summary, SmartLife and Zimba are key examples of how different organizational missions drive different choices and create contexts that support or present barriers leading to different results. IDEO.org prioritized achieving measurable impact through their HCD projects. As such, IDEO.org selected professional designers, business people, and development experts for the SmartLife design team. They designed a service that was ready to launch with existing technologies, prototyped the service to assess market feasibility, and partnered with highly-resourced reputable implementation organizations. The SmartLife pilot launched six months after the completion of the design project and was serving 4,200 customers in its first year. Although IDEO.org did not build capacity for local innovation through the SmartLife project, it was not their objective.

In contrast, IDDS prioritized building capacity for technological innovation in developing countries. IDDS recruited people with limited experience in design to enhance and support their creative confidence and ability. The Zimba project was championed by a local inventor, and Zimba's design and prototyping approach supported and leveraged assets in developing country settings. IDDS intentionally did not set up partnerships with implementing organizations in order to give the design team autonomy in determining the direction of the project. Although the Zimba team faced challenges in developing a new technology and business model, the Zimba project provided several students and novice designers with the opportunity to enhance their skills in HCD for Social Impact. Moreover, as several IDDS alumni volunteered for years on the Zimba project, it appears that the Zimba project was successful in meeting IDDS's ultimate goal of inspiring people to contribute positively to society.

7.6 Frameworks for Project Analyses

This section introduces some frameworks and tools for project analyses, and demonstrates their utility in the analyses of the SmartLife project and Zimba project. It is hoped that these frameworks will be useful for project analyses particularly in the field of HCD for Social Impact.

The Ten Types of Innovation framework provides guidance for the different ways in which an organization may innovate (Keeley, Walters, Pikkel, & Quinn, 2013). It also provides some indication of whether the design challenge or project brief is framed too narrowly, if it limits the types of innovation the design team is likely to consider. I based my modified scale assessing Levels of Stakeholder Influence on the collaborative work of Harder, Burford, and Hoover (2013). The scale is intended to clarify which stakeholders are participating in each stage of the design process and their respective levels of influence in decision-making. The Impact Optimization Quad may help organizations clarify their relative prioritization of achieving social impact or financial returns (Calderon, 2014b). The five-point scale of deployment complexity may help in identifying the most challenging aspects of deployment before significant investments are made in the intervention (Buluswar, Friedman, Mehta, Mitra, & Sathre, 2014).

7.6.1 Problem Framing and the Ten Types of Innovation

IDEO.org has full-time professionals dedicated to forming strategic partnerships, properly scoping projects, and framing design challenges. Partnering with organizations with sector expertise provides some degree of problem validation. The client organizations for SmartLife (WSUP, Unilever, and GAIN) have expertise in providing clean water, hygiene products, and nutritional supplements. As experts in these sectors, they are better able to assess the potential viability of a business concept. They have successfully implemented large-scale health programs in multiple countries, and strategically selected Nairobi, Kenya as a promising site to pilot a water and health business. The SmartLife design challenge was posed as "How might we design a *scalable business* to sell water alongside hygiene and nutrition products?" (Vechakul, 2012, emphasis added). The team was designing for scale and thinking of business models from the start of the project.

In contrast, IDDS's design challenges may be proposed by partner communities, IDDS participants, or IDDS organizers. Some design challenges were framed by faculty members from technology-focused universities (e.g., MIT, Olin, etc.), who have experience and expertise in problem framing. Other design challenges were framed by people who may have limited experience or training in design challenge framing. The initial design challenge for Zimba was written by an American mechanical engineer (Zimba team member, S5), who volunteered to lead a field research trip to Zambia as part of an MIT D-lab course. He saw an opportunity to address the problem of diarrheal disease in villages with a device that would automatically and accurately chlorinate water as it flows out of hand pumps. An inventor in Kolkata, India read the design challenge online and was inspired by the cholera outbreaks caused by Cyclone Aila in 2009 to work on a prototype (Zimba team member, S5).

A Zimba team member noted how the initial design challenge specified batch chlorination:

> You might imagine that the flow rate is going be different coming out [of hand pumps] so it can be hard to chlorinate consistently at the same proportion every time. [Zimba's inventor] had this idea of breaking it into a batch process, so you know how much water you have and given the batch, you can add the same amount of chlorine to that each time. […] That was how the challenge was framed to him, *'How do we make this batch-process chlorination in community water sources more accurate?'* The design itself has changed a lot but it's always addressed that one design challenge question. We haven't really opened it up more validly to be like, "Is there another way to chlorinate water? Could it be a flow process? Is there just another solution to this entire problem?" — Zimba Team Member (S5).

A study in Bangladesh found that collecting water from the Zimba dispenser requires more time than collecting water from traditional hand pumps due to the Zimba's batch chlorination mechanism (Amin, et al., 2013). There are reliable mechanisms for estimating the flow rate of water and chlorinating water as a flow process, but the design team has not yet further explored other technological mechanisms (Zimba team member, S5). It is possible that the narrow problem framing limited the realm of solutions considered by the Zimba team.

The Ten Types of Innovation framework may be used to indicate whether problem framing is too narrow, or if it limits the types of innovation the design team is likely to consider. The Ten Types of Innovation are organized into three categories: Configuration (the internal attributes of an organization), Offerings (the core product, service, or system offered by an organization), and Experience (the external or customer-facing attributes of an organization) (see Figure 7.6). Proponents of the Ten Types framework assert that "companies that integrate multiple types of innovation will develop offerings that are more difficult to copy and that generate higher returns" (Doblin, 2015). Moreover, there may be opportunities to generate additional value for customers by innovating in multiple ways.

Figure 7.6. Quick definitions and detailed descriptions of the Ten Types of Innovation framework (Doblin, 2015)

The Ten Types of Innovation framework is a complementary tool to the Social Blueprint framework. The Social Blueprint and Ten Types of Innovation frameworks each have

advantages and disadvantages. The Ten Types of Innovation framework describes different ways in which companies may innovate, and may help companies think of additional ways to innovate. One limitation of the Ten Types of Innovation framework is that it does not necessarily indicate how the different types of innovation should align or which stakeholders are served by each type of innovation. The Social Blueprint framework enables one to more easily see the interactions among various building blocks and ensure alignment throughout the building blocks. In particular, the Social Blueprint distinguishes between various stakeholders and indicates more clearly the value propositions, stakeholder relationships, and channels that serve each stakeholder. One limitation of the Social Blueprint framework is that it does not challenge an organization to innovate in multiple ways. Although it is possible to innovate in any one of the Social Blueprint building blocks (as the Ten Types of Innovation framework suggests), it is possible to achieve alignment of the building blocks without necessarily innovating and instead following standard practices.

By mapping the Ten Types of Innovation onto the Social Blueprint (see Figure 7.7), we may compare and contrast these two frameworks. Most of the types of innovation in the Configuration category (shown in teal) correlate well with the building blocks in the Root Strategy Pillar (left side of the Social Blueprint). These types of innovation and building blocks represent the fundamental operational elements needed to make an organization or program successful. The types of innovation in the Offering category (shown in orange) correlate well with the Value Propositions building block. Most of the types of innovation in the Experience category (shown in red) correlate well with the Business Case Pillar (right side of the Social Blueprint). These types of innovation and building blocks represent the ways in which the organization engages and reaches stakeholders.
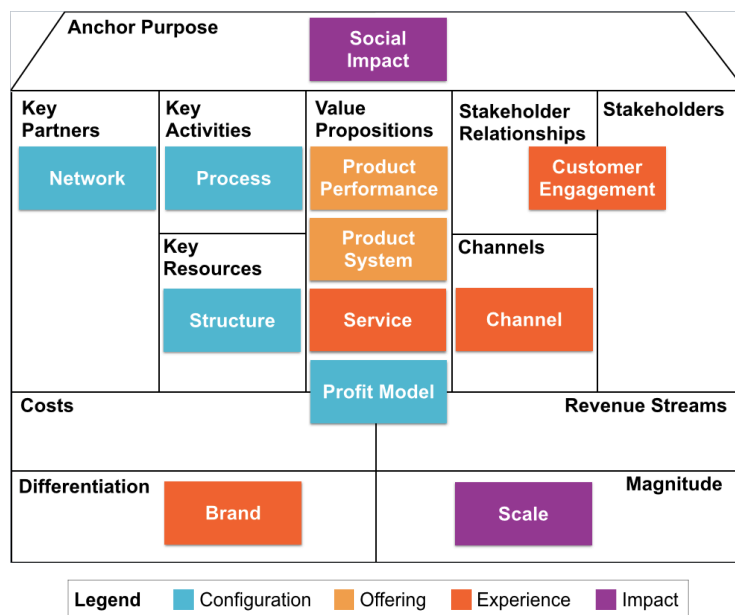

Figure 7.7. My mapping of the Ten Types of Innovation onto the Social Blueprint framework

It is interesting to note that the Ten Types of Innovation framework was developed by analyzing the ways in which for-profit companies tend to innovate. The mapping of the Ten Types of Innovations onto the Social Blueprint suggests that perhaps organizations with a social

impact motive may also innovate in how they achieve social impact or scale (shown in purple). TOMS® One for One campaign, in which the company donates a pair of shoes to a child in need for every shoe purchased (TOMS, 2015), is one example of an innovation in how social impact and financial returns are scaled up in unison.

A potential topic for future research could be an investigation of potential associations between the framing of the design challenge and the resulting types of innovation represented by the solution. As shown in Figure 7.8, SmartLife represents nine of the Ten Types of Innovation while Zimba only represents one of the Ten Types of Innovation. It is interesting to note that SmartLife's design challenge "How might we design a *scalable business* to sell water alongside hygiene and nutrition products?" explicitly focused on scalability and the design of a business. SmartLife's problem framing stimulated the exploration of multiple types of innovation. The SmartLife team unearthed key insights about user needs (e.g., clean water being the driver, and convenience and reliability being latent needs), identified women as decision-makers about health in the household, experimented with branding, discovered how multiple touch points (e.g., door-to-door sales representatives, delivery vehicles, and retail stores) inspired trust, and developed a proof-of-concept for a subscription model.

Ten Types of Innovation		How you…	SmartLife	Zimba
CONFIGURATION	Profit Model	make money	SmartLife is subscription service for clean water delivery, which offers reliability and convenience for customers and steady demand for SmartLife.	
	Network	connect with others to create value	IDEO.org partnered with a corporation, NGO, and a global network with expertise in the sectors of health, water, and nutrition.	
	Structure	align your talents and assets		
	Process	use signature or superior methods to do your work	SmartLife created the only map of their pilot area to plan delivery routes. Customers pay via mobile services, like M-Pesa (Hewens 2013).	
OFFERING	Product Performance	employ distinguishing features and functionality	SmartLife has a back-up water source and a 5000 liter storage tank to ensure supply during water shortages (Hewens 2013).	Zimba automatically and accurately treats water from sources with inconsistent flow rates.
	Product System	create complementary products and services	SmartLife plans to offer hygiene and nutrition products after successfully piloting the water delivery service (Hewens 2013).	
EXPERIENCE	Service	support and enhance the value of your offerings	Reliable water delivery and, eventually access to hygiene and nutrition products enhances the value of clean water. (Bigio et al. 2012)	
	Channel	deliver your offerings to your customers and users	"It was a combination of retail locations, delivery, and door-to-door that solidified the customers' confidence." (Bigio et al. 2012)	
	Brand	represent your offerings and business	The SmartLife brand is represented on uniforms and water containers, as well as through professional, friendly, and reliable service.	
	Customer Engagement	foster distinctive interactions	"A friendly SmartLife sales agent comes to your home weekly to customize your orders and provide you with top quality service" (Bigio et al. 2012).	

Figure 7.8. The Ten Types of Innovation: Analysis of SmartLife and Zimba

In 2009, Zimba's design challenge ("How do we make this batch process, chlorination in community water sources more accurate?") initially focused solely on the product, and may have

directed the team's attention towards product performance innovation rather than innovations in the organization's configuration or stakeholders' experience:

> [Zimba's inventor] made this awesome invention that works well, solves a real problem, so technology-wise, it is a success. I applaud him for all these years of hard work and fiddling with that. And it's genius! No moving parts and it does these complex spitting out things, sucking in things, and the technology is cool. That to me is a big big success. But we always struggled with getting it beyond the prototypes and out to more people. — Zimba Team Member (S4)

Working on multiple types of innovation simultaneously could lead to improvements to the system overall. In particular, a Zimba team member reflected upon how the technology and business design could have informed one another:

> Even little things like what's the way to facilitate things for whoever's going to be operating the device — we probably didn't think through a lot of that on the technology side. We still can't really see the level of chlorine without opening it up, so it's hard to tell when to refill. Things like making it easier to collect payments. That's something where you can think about a technological way to address that if we had known that the business model was important. Thinking about the business model would have more informed the technology design, but it probably didn't happen as much as it should have." — Zimba Team Member (S5)

When technology is designed separately from the business model, it is hard to ensure that it will fit into the larger context of the implementation plan:

> At some point, we divided into an engineering and business team working parallel to one another. And there was some knowledge transfer between the two. For me, when I was working in that setup, I was looking at trying to fix the design of this to do this. So it was like an engineering problem that I was trying to solve, and it did not fit into the larger context. I just did not know how that fit into the larger context. — Zimba Team Member (S6)

If the Zimba team had reframed their design challenge, they may have considered other types of innovation to develop a more robust and sustainable offering. The trajectory of the Zimba project reflects the sequence of project development described by the Director of IDDS:

> The hard work is first taking an idea and making it work. And then the hard work is making it into a product. And then the hard work is making it into something that people will buy. And then the hard work is scaling it up. — Amy Smith, Director of IDDS (as quoted in Bansal, 2015)

The SmartLife and Zimba case studies suggest that perhaps the business model should be designed alongside the technology. According to the Lean Startup methodology, "the question is not 'Can this product be built?' Instead, the questions are 'Should this product be built?' and 'Can we build a sustainable business around this set of products and services?'" (Ries, 2015). Learning from experiences, such as the Zimba project, IDDS began integrating technology and business design in 2011.

7.6.2 Stakeholders' Levels of Influence During the Design Process

"The importance and role of the participation of 'others' in design has been debated in multiple contexts involving functionality, culture, usefulness, social responsibility, identity, design education, and sustainability" (Harder et al., 2013, p. 41). Participation is considered a

core ideal in "sustainable development" both as a human rights issue and to increase the efficacy of interventions (Bell, Morse, & Shah, 2012). Harder and colleagues developed a framework to assess levels of participation across different disciplines. Their framework assesses three dimensions of participation: *depth* refers to the extent of control over decision-making by the stakeholders, *breadth* refers to the diversity of stakeholders participating in the process, and *scope* refers to the various stages of key decision-making (Harder et al., 2013). The *depth* scale is intended as a neutral benchmark for comparison across various practices. Higher levels of control over decision-making are not necessarily superior, and there may be several reasons and situations in which less participation is appropriate (Hayward, Simpson, & Wood, 2004).

I have modified Harder and colleagues' participation scale in various ways to customize it for the analysis of design for development projects (see Figure 7.9). Harder and colleagues developed their participation scale based on indigenous participation in intercultural education initiatives, and thus, their *depth* scale refer to different modes of learning (e.g., learning about, learning from, learning together, learning as one) (2013). Harder and colleagues also describe these modes of learning in terms of stakeholder A and stakeholder B. However, there are sometimes three or more stakeholders involved in decision-making processes, and there may not be a single stakeholder that holds most of the power through all stages of a decision-making process. In order to broaden the applicability of Harder and colleagues' scale, I shifted from references to modes of learning to roles indicating levels of influence in decision-making processes. In particular, I've substituted "learning about" with "informants," "learning from" with "advisers," "learning together" with "partners," and "learning as one" with "equals." The descriptions for each of these levels correspond to Harder and colleagues descriptions except stakeholder A and stakeholder B are respectively replaced with the generalized terms "stakeholder" and "others" to indicate the role of the stakeholder being assessed in relation to one or more other stakeholders.

		STAKEHOLDERS ARE...	
	6	LEADERS	Stakeholder has more influence in decision-making than others.
	5	EQUALS	Stakeholder and others discuss relevant issues by focusing on the ideas themselves, rather than the source of the ideas.
	4	PARTNERS	Major issues are negotiated through discussion between the stakeholder and others. Most decisions are made jointly, e.g. by consensus-building.
	3	ADVISERS	Stakeholder is asked for substantive, on-going input and contributions are considered seriously. Others still make the final decisions.
	2	INFORMANTS	Others asks stakeholder's input on specific topics periodically, but does not feel obliged to take them into account. Others make the final decisions.
	1	OBSERVERS	Others makes decisions without stakeholder's involvement, but the stakeholder may observe the process to understand how and why decisions are made.
	0	NOT INVOLVED	Stakeholder is not involved.

(Increasing Influence — vertical axis label)

Figure 7.9. Levels of stakeholder influence (modified based on Harder et. al., 2013)

In addition, I have added three additional levels to Harder and colleagues' scale. The highest level of Harder and colleagues' scale is "learning as one," in which there is no distinction between stakeholder groups in decision-making. In my modified scale, "equal" is the equivalent of "learning as one." I added "leaders" as a level for situations in which the stakeholder has more influence in decision-making than others. The lowest level of my modified scale is "not involved," which refers to situations in which the stakeholder does not participate in this stage of the decision-making process. Above the level of "not involved" is "observers," in which the stakeholder observes the decision-making process and may understand how and why decisions are made. In my modified scale, I also distinguish between having no voice, having a voice, and having decision-making power. Stakeholders who are "not involved" or "observers" have no voice in decision-making. "Informants" and "advisers" have a voice, but others ultimately make the decision. "Partners," "equals," and "leaders" have decision-making power, and make decisions by respectively negotiating different interests, acting as one, or making decisions with more influence than others.

In terms of *scope* or stages of decision-making, Harder and colleagues chose the general stages of initiation, design planning, implementation, reflection, and communication. IDEO.org and IDDS represent their respective design processes in three phases for educational purposes (see Chapter 6). Although this simplification of the design process makes it more accessible and easily understood by novices, it does not capture the critical decision-making stages in the design process. To customize Harder's scale for an analysis of design projects, I've identified Understanding, Ideation, Concept Selection, Prototyping, and Implementation as key decision-making stages. At each of these stages, there may be different levels of stakeholder influence on the decisions being made.

In terms of *breadth* or diversity of stakeholders participating in a process, Harder and colleagues referred generally to decision-makers/leaders, project implementers/staff managers, project beneficiaries/clients, and the wider society (Harder et. al, 2013). To customize the scale for an analysis for design for development projects, my stakeholder groups are the users, design team, local liaisons, and project champion. Figure 7.10 demonstrates an application of my modified scale to the SmartLife and Zimba projects.

For SmartLife, the client organizations are the project champions. A Kenyan market research firm assisted the design team in organizing interviews, hiring translators, and managing the logistics for prototyping. They are considered the local liaison for all stages of the design process except the Implementation Phase. Kenyan SmartLife employees (e.g., as the store manager and water technician) are considered local liaisons for the Implementation Phase. For Zimba, although the inventor is also on the design team, he exhibits a higher degree of influence than other design team members, so he is analyzed separately as the stakeholder "champion." The inventor of Zimba is a native of Kolkata, and is familiar with the context of use of chlorine dispensers in rural villages so he is also considered a local liaison. It is important to note that for both SmartLife and Zimba, the local liaisons are not members of the target user group since they do not rely on water treated or provided by Zimba or SmartLife. There are likely to be differences between how these local liaisons perceive user needs and how the users themselves perceive their own needs. Local liaisons may have insights about users that users themselves may not be aware of, and local liaisons may also be unaware or inaccurate in their perception of user needs. In fact, users played an active role only during the Understanding Phase and Prototyping Phase for both SmartLife and Zimba. In both projects, users acted as "informants" by participating in interviews and observations, and providing feedback on prototypes.
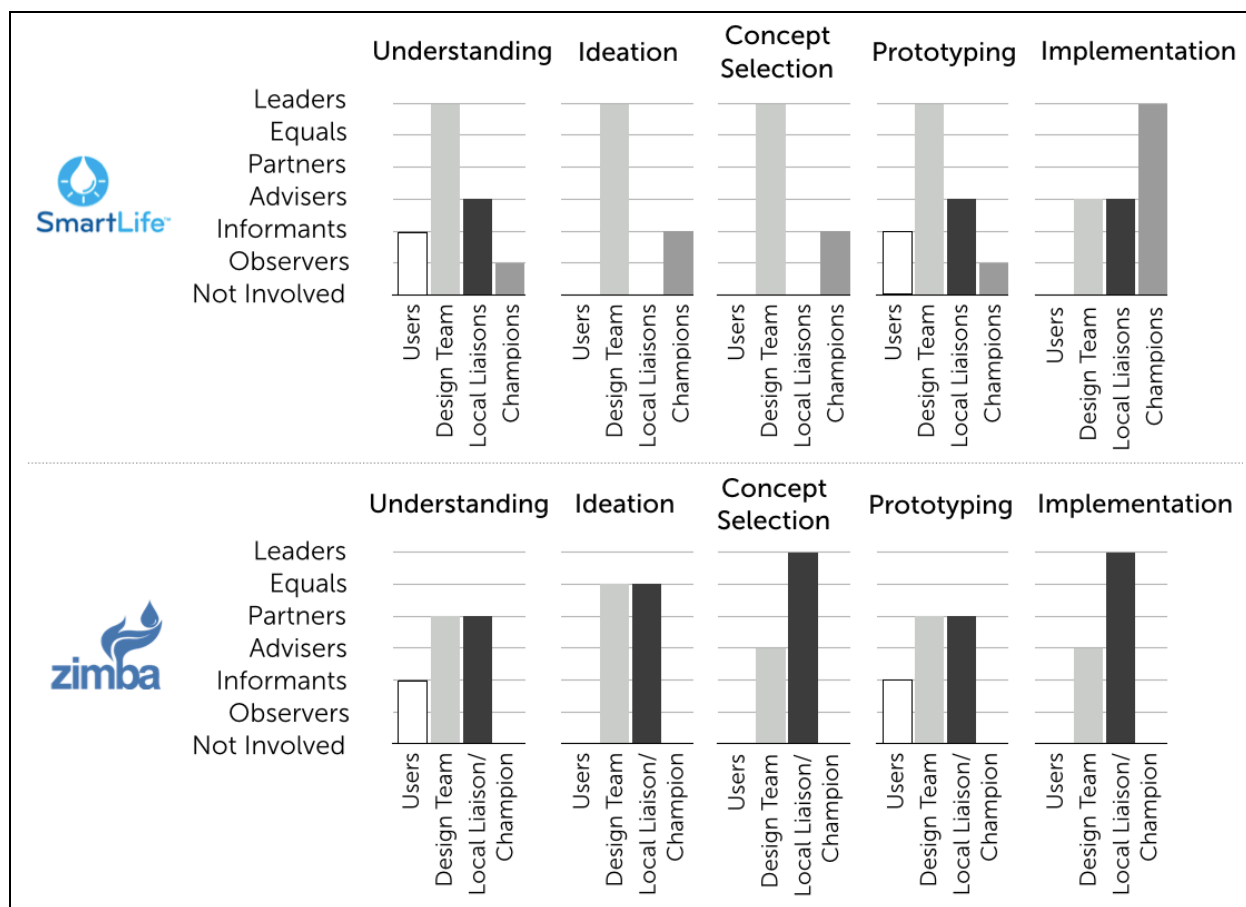
Figure 7.10. Comparison of levels of stakeholder influence for the SmartLife and Zimba projects. White and black denote local stakeholders. Light grey and dark grey denote foreign stakeholders.

Harder and colleagues created distinct levels for "denigrated" and "neglected" to reflect the potential that decisions are contrary to the stakeholder's interests or that decision did not affect or account for the stakeholder's interest. In my opinion, the degree to which the decisions benefit, harmed, or did not affect or account for the stakeholders interests is a different dimension than their level of participation or role in the process. In my modified scale, a (+) indicates that decisions were made in the interest of the stakeholder, (0) indicates that the stakeholders was not affected or their interests were not taken into account, and (-) indicates that decisions were made that were to the detriment of the stakeholder. In the case of SmartLife, decisions are made in the interest of users and champions throughout the design process. The interests of the design team and the marketing firm (local liaisons) were not considered throughout the design process. The interests of Kenyan SmartLife employees (local liaisons) are considered during Implementation Phase. In the case of Zimba, the users' interests are considered throughout the design process. The champion's interests are considered during Concept Selection, Prototyping, and Implementation, since he is the only stakeholder working full-time to prototype and implement. Decisions made during these stages are strongly influenced by the champion's dedication to serving the most vulnerable populations.

By comparing the roles of local stakeholders with those of foreign stakeholders, one might infer that Zimba's design process is more participatory than SmartLife's design process. In the

case of SmartLife, foreign stakeholders (i.e., the design team and champions) had more influence in the decision-making process than local stakeholders. The design team was the leader in almost all stages of the design process. The client organizations (champions) had more influence during the Implementation Phase. In the Implementation Phase, the client organizations act as "leaders," initiating and directing the process, whereas design team members were "advisers," who provided substantive input through their design recommendations and final deliverables. In the case of Zimba, the local stakeholder (i.e., the inventor plays the roles of champion and local liaison) either leads or shares power with the design team throughout the design process. During the Understanding Phase and Prototyping Phase, the inventor and design team have different perspectives and have different interests, and were thus acting as partners rather than equals. During the Ideation Phase, the inventor and design team acted as equals and made decisions together. During Concept Selection and Implementation, the inventor was the leader with the design team acting as advisers. The respective participatory philosophies of IDEO.org and IDDS (see Section 6.2) may influence the degree of local versus foreign stakeholder influence during the design process. With IDEO.org's expert-led participation philosophy, it is logical that the design team would be in the "leader" role for most of the design process. With IDDS's co-creative participatory philosophy, it is logical that the foreign design team would share power with the local liaison or project champion.

For both SmartLife and Zimba, the project champions were included in all critical decision-making stages of the design process. For SmartLife, the client organizations played an active role by providing feedback as "informants" during Ideation and Concept Selection. Even passive roles, like observing, were important for developing empathy for users and buy-in for implementation. During the Understanding Phase and Prototyping Phase, the client organizations were "observers." They accompanied the design team during field research in Kenya, and were able to hear directly from users, as well as witnessing first-hand the users' reactions during the Prototyping Phase. Engaging the client organizations (clients) throughout the design process may increase buy-in and the likelihood that the clients will implement the design concepts recommended by the design team. IDEO.org's Executive Director noted that client organizations report a change in thinking after engaging in a design project with IDEO.org (Wyatt, 2014). For Zimba, the inventor was the project champion, and either led or shared decision-making power with the design team throughout the design process.

7.6.3 The Impact Optimization Quad and Project Complexity

Social ventures typically have a dual goal of achieving financial sustainability or profitability and producing financial returns. The prioritization of social impact or financial returns may influence the level of project complexity addressed by a social venture. The Impact Optimization Quad developed by Impact Strategy Advisors describes four "social venture types" based on whether the social venture is maximizing financial returns, social impact, both, or neither (Calderon, 2014a). SmartLife can be categorized as a "Lion (Maximizer)" because its business model maximizes both social impact and financial returns (see Figure 7.11). Zimba can be categorized as a "Dolphin (Impact Optimizer)" because it prioritizes serving the most vulnerable populations and is willing to compromise financial returns. The Impact Optimization Quad is a useful framework that offers one possible explanation for why Zimba chose to focus on a comparatively more challenging development challenge than SmartLife: Zimba is prioritizing social impact and is willing to compromise financial returns, whereas SmartLife is attempting to maximize both financial returns and social impact.
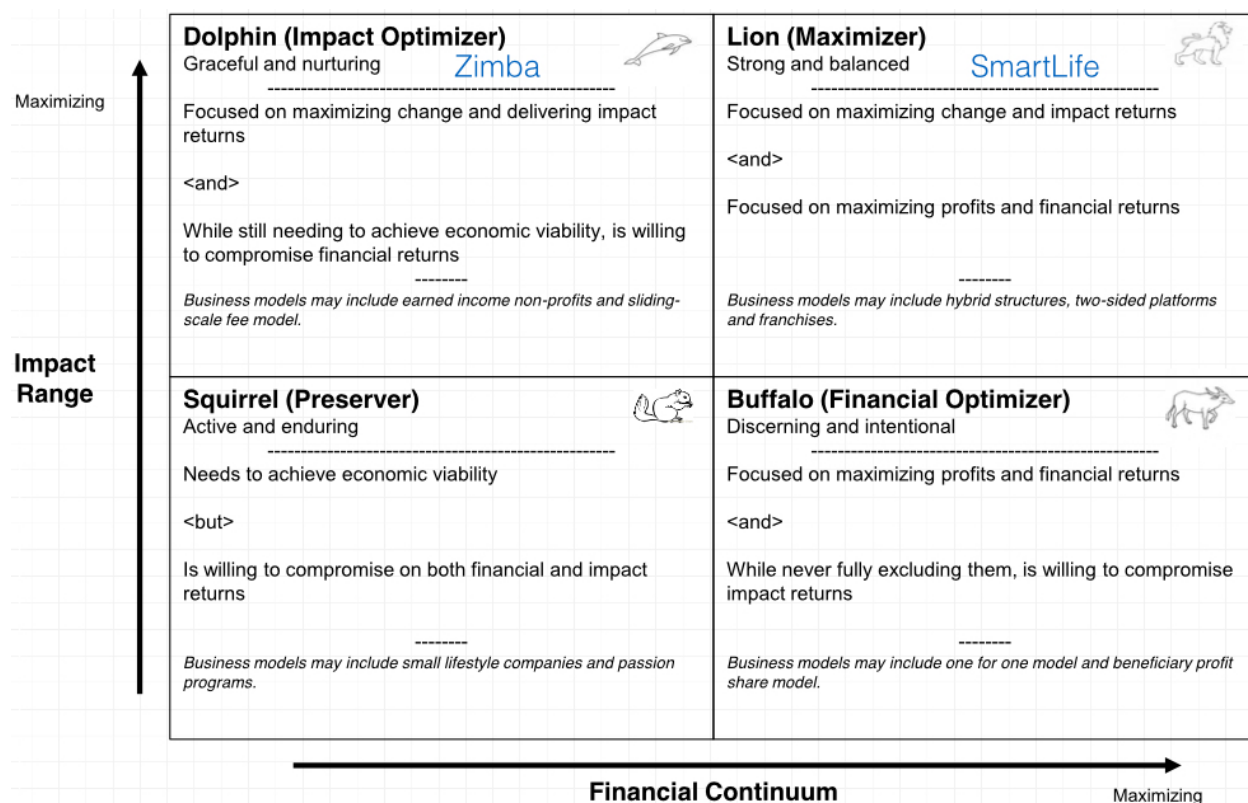
Figure 7.11. SmartLife and Zimba's Social Venture Types (modified from Calderon, 2014a, p. 3)

The Institute for Globally Transformative Technologies at Lawrence Berkeley National Lab developed a framework to assess the relative complexity of deploying various technological interventions to address development challenges (Buluswar et al., 2014). In order to identify the 50 breakthroughs (critical scientific and technological advances) needed for sustainable global development, a 5-point scale (simple, feasible, complex, challenging, and extremely challenging) was developed to subjectively assess the difficulty of large-scale deployment in terms of policy reforms, infrastructure development, education and human capital development, behavior change, access to user finance, and an innovative business model (see Figure 7.12). Since this framework was developed to assess non-technical barriers for the development of breakthrough technologies, the complexity of technology development was not included in the framework. I have added a five-point scale to assess the complexity of technology development (see Table 7.3).

Table 7.3. Scale for assessing complexity of technology development

	Simple	Feasible	Complex	Challenging	Extremely Challenging
Technology	No need for technology development.	Some modification of commercially available technology.	Technology must be designed, but no scientific research is needed.	Applied research is required to gain the knowledge to meet a specific need.	Basic research is required to gain knowledge a topic without a specific application in mind.

	Simple	Feasible	Complex	Challenging	Extremely Challenging
Policies	Minimal role of policy/regulation	Low role of policy/regulation	Regulated market with supportive policies	Highly regulated market with policy changes required	Highly regulated and controversial changes required
Infrastructure	Minimal need for infrastructure	Dependent on existing infrastructure	Requires some improvements to existing infrastructure	Requires moderate improvements to infrastructure	Requires major improvements to infrastructure
Human capital	Minimal need for human capital development	Low-moderate need for human capital development	Moderate need to train a limited number of people	Requires high level of training for large numbers of people	Requires national scale training programs
Access to user finance	Financing not required	Limited financing required	Moderate financing needed, viable mechanisms available	Significant financing required, limited mechanisms available	Significant financing required, no identified mechanism
Behavior change	No behavior change required	Minimal behavior change required	Moderate behavior change required with evidence of behavior change being viable	Major behavior change required, potentially on daily basis	Significant behavior change needed on daily basis, changes contrary to cultural norms
Existing demand	Strong existing demand	Existing demand	Moderate demand	Low demand, needs to be built	Extremely low demand or not a perceived need
Market fragmentation/ Distribution channels	Highly concentrated market or well defined channels	Fairly concentrated market and/or well defined channels	Moderate fragmentation of customers, under-developed channels	Fragmented market, weak distribution channels	Highly fragmented, challenging to reach customers
Business model innovation	Clear deployment models existing at scale	Deployment model in process of scaling	Deployment model(s) being tested	Deployment model(s) being tested, major hurdles outstanding	No identified deployment model, major hurdles identified

Figure 7.12. Framework for assessing complexity of large-scale deployment of development interventions (Buluswar et. al., 2014, p. 4)
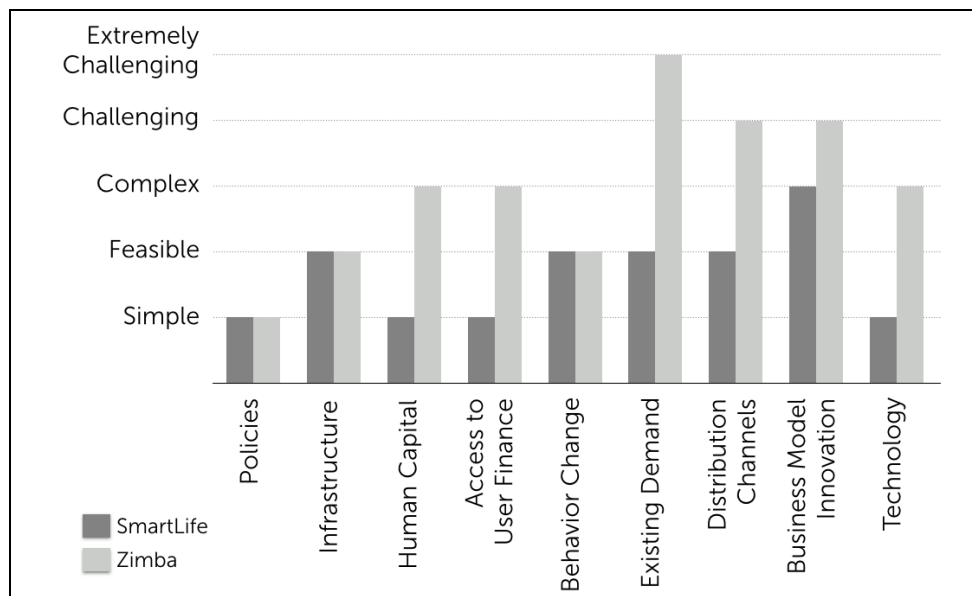
Figure 7.13. Comparison of the complexity of SmartLife's and Zimba's implementation models

I analyzed the relative complexity of SmartLife's and Zimba's implementation models (see Figure 7.13). Overall, SmartLife may be categorized as "feasible" in terms of deployment complexity. Business model innovation was rated as complex because the deployment model is still being tested, but no major hurdles have yet been identified. The pilot results thus far indicate that there is potential for the model to be scalable. The SmartLife business is being piloted in a market where demand for water exceeds supply, and there are higher-priced yet lower-quality competitors. SmartLife's customers have a regular salary and are dissatisfied with the exorbitant prices they pay for water that is not reliably available, clean, or delivered in a timely professional manner. They are located in Nairobi, a densely-populated city with adequate roads and access to water and electricity. A small-scale water treatment facility can feasibly be operated in this setting at a cost that is comparable to what consumers are already paying. SmartLife's customers already understand the value of clean drinking water. They are accustomed to paying for water, and the pilot results suggest that customers are willing to pay more for the convenience and reliability of having a professional service treat and deliver their water. Delivering water and consumer goods is possible given the availability of water trucks, roads, and customers located close to one another. Customers are also able to place orders and make payments using mobile phones and the prevalent and reliable M-PESA service. In terms of infrastructure, behavior change, existing demand, and distribution channels, SmartLife's model was categorized as "feasible." The remaining categories of policies, human capital, access to user finance, and technology were categorized as "simple." No policy change was required in implementing SmartLife. Although skilled human capital is required (e.g., a water treatment technician, sales representatives, and a store manager), SmartLife did not have to provide significant training since there are locals in Nairobi, Kenya who have the required training and skills. Since customers have the disposable income to pay for water and water delivery, no user finance was required. SmartLife also did not have to develop new technologies, since there was commercially available technology for water treatment, mobile phone payment, and delivery.

In comparison, Zimba's deployment model was categorized as "challenging." A Zimba team member reflects upon some of the challenges with developing viable business model, government regulations, and small-scale manufacturing:

> Water is maybe not the easiest sector to work in. There are a lot of groups doing wonderful things in it, and yet there are many places without still a lot of access because there are a lot of challenges around perception and infrastructure and who knows what else, financing, so it's hard to ask people to pay. There are so many water businesses that will get people to pay consistently and monsoon season hits, and the payment goes down and they are willing to offer water on credit, because they are not going to turn people away from water. Water is needed. But then people get used to getting water on credit, and just get water on credit indefinitely after the monsoon. There are many stories like that.
>
> We even thought about talking to government about would municipality support this, as a way to provide treated water, in areas where their own government structure may not be set-up yet, or maybe we could supplement, but the politics are slow. One of the reasons that Zimba's structure is a for-profit in India even rather than non-profit is that because the government regulation takes three years to be approved to receive foreign funds as Indian non-profits. And sometimes, even after the three years that you need to be eligible, you still have to get approved. I've heard of people taking a year and a half after that, just to file it. […] Or we would have to do under the table, which a lot of, one of the major NGOs that we were thinking about partnering with, transferred money probably not in the way they are supposed to. So things like that are other barriers that can slow things down.
>
> In terms of manufacturing, we kept wishing that we were in Shenzhen, China […] (the manufacturing city in China), because sometimes we would want the technology manufactured more professionally. We had an idea, but we just needed a couple of units to try, maybe even willing to buy 50 maybe. We couldn't do 1000 just because it's not in our budget. Ordering the molds we make could be expensive. So initially, for some of our prototyping, when we were less sure of the design, we talked to potential manufacturers to help us make it. And they wouldn't even talk to us, because we only wanted to make like 10 units. I remember when we were talking to this one plastic manufacturer, and they are just like, "Yeah, yeah, we will try to help you out," and just never responded to us because we were not in their higher priority because we are not big customers. That kind of lack of infrastructure, and ... yeah probably a number of other factors that affect maybe everybody else in the region. — Zimba Team Member (S5)

The most challenging aspect of Zimba's deployment model is that there is extremely low demand for chlorinated water among Zimba's target users. The communities Zimba hopes to serve may not be aware of the link between contaminated water and diarrheal disease. Furthermore, they are primarily subsistence farmers or informal laborers who have limited disposable income, and pay little or nothing for water. Most do not currently treat their water. The taste of chlorinated water may be unfamiliar although some may become accustomed to it over time. Although Zimba may overcome this challenge through education, the lack of existing demand means that it is "extremely challenging" for Zimba to enter this market. On the other hand, the behavior change is "feasible" since users only need to slightly modify their behavior. Users may collect water as they typically would, but they may have to queue longer due to the batch chlorination mechanism (Amin et al., 2013).

The value proposition to users is unclear so it has been challenging to determine who will pay for the chlorine dispenser and its maintenance. The business model is categorized as "challenging" since Zimba has tested some deployment models, such as partnering with NGOs, but major hurdles are outstanding. Zimba has had difficulty identifying partner organizations with aligned goals and the resources required to educate users and maintain chlorine dispensers. Zimba is testing out a micro-franchise model but acknowledges that maintaining chlorine dispensers would only provide supplemental income and that the micro-franchisee would need other forms of livelihood. Since Zimba is treating community water sources, it is challenging to ensure payment from all users. Furthermore, the community hand pump may be the sole source

of water in the area so for moral reasons, the Zimba team cannot limit access to water to those who cannot pay for chlorination. Access to user financing is categorized as "complex" since end users may not have to pay for water directly if another entity (e.g., government, NGO, community group, etc.) pays for the chlorine dispensers and its use. Although there are some mechanisms through which Zimba can lower or eliminate cost to end users, it remains unclear which mechanism will work.

Zimba's target markets are fragmented and distribution channels are weak. This aspect of implementation is categorized as "challenging" since rural communities are sparsely populated and roads may be poorly maintained, which makes it time-consuming and costly for maintenance people to regularly check and refill the Zimba chlorine dispensers. Human capital is also categorized as "complex" because some personnel must be trained to calibrate the chlorine dispenser to treat different levels of water quality, and to also maintain and repair the chlorine dispenser. Technology is also categorized as "complex." Although Zimba is a new technology, fundamental scientific research was not required to develop it. In terms of infrastructure, Zimba was rated as "feasible." Although Zimba is dependent upon there being an existing water source, Zimba does not require any improvements to existing infrastructure. Notably, the Zimba chlorine dispensers were designed to operate in settings without electricity, and minimize the likelihood of technical failure by reducing the number of moving parts. Policy was rated as "simple" since no policy change is needed with Zimba's current deployment model.

Clearly Zimba is targeting a more challenging development situation than SmartLife. The Zimba team has considered other business models that serve more accessible markets. For example, the Zimba chlorine dispenser could be used to treat water in rooftop plastic water reservoirs, which are prevalent in Kolkata, India. The population density and ease of transport in Kolkata would make it feasible for a maintenance person to service chlorine dispensers. Serving customers with disposable income could mean that such a service could be financially viable. Starting in markets with lower barriers to entry could have enabled the Zimba team to secure the demand and income stream needed to refine the design and shift to more economical and higher quality manufacturing. Reducing cost, and increasing ease and quality of manufacturing would then make the chlorine dispenser more accessible to low-income markets as well. The Zimba team could also charge higher-income customers more to subsidize the cost for low-income customers. The focus of IDDS in 2010 was business model design, and the Zimba team brainstormed several business models. However, the inventor and founder of Zimba remains solely committed to serving the communities that have limited or no other alternatives for clean drinking water. One team member stated, "we had these interesting ideas, but it all came down to whether or not [Zimba's inventor] would want to carry them out" (S4).

It is interesting to note that such a fervent dedication to serving the poorest of the poor in areas with the least infrastructure may be limiting project progress and serving as a barrier to reaching the ultimate goal of achieving some social impact. Although working with for-profit clients or partners means that the product or service may be geared towards more profitable markets first, it may be a good stepping stone towards serving those who need it most.

7.7 Discussion

By comparing the SmartLife and Zimba projects, this chapter analyzed the similarities and differences in the HCD process of IDEO.org and that of IDDS. The different trajectories of these

projects are influenced partially by the particulars of these projects and partially by the differences between IDEO.org's Project-Based Consulting Model and IDDS's Creative Capacity Building Model. With IDEO.org's model, professional consultants help established organizations achieve measurable impact at scale. With IDDS's model, budding innovators learn to design technologies and launch social enterprises.

IDDS categorizes project success in four phases: development (or design), pilot, early adoption, and scale (see Section 5.3.2 IDIN's Evaluation Framework for IDDS). There are different factors that influence success in the development (or design) phase, than success in the other phases. For example, immersion in the context of use (fieldwork), prototyping, and a diverse team could be considered factors influencing success in the design phase:

> Fieldwork (being in the field), designing in the environment that you're trying to change was really important. Prototyping, rapid prototyping was also… maybe those two things and a team that could draw on their intuition and experience. These three are the key elements that made the project successful. — SmartLife Designer (S21)

In my analysis of these project case studies, I focused on factors influencing success in progressing from the design phase to the pilot phase. With IDEO.org's Project-Based Consulting Model, design teams are typically engaged in the design or development phase, but not in the pilot phase. Similarly, most IDDS design teams are engaged in the design or development phase, but a smaller proportion of teams progress to the pilot phase. SmartLife and Zimba progressed beyond the pilot phase to achieve early adoption with SmartLife serving 4,200 customers and Zimba serving more than 3,000 customers. Although both SmartLife and Zimba are still in the process of developing sustainable business models and a scale-up strategy, they are considered successes respectively by IDEO.org and IDDS. Based on interviews with current and former staff or volunteers from IDEO.org and IDDS, some of the factors influencing success in progressing from the design phase to the pilot phase for SmartLife and Zimba appear to be pertinent in other projects, as well.

Problem validation:

IDEO.org's clients are organizations with significant experience in their project sector. Based on this experience, they have some understanding of user needs and markets with a lower barrier to entry. An IDEO.org staff member elaborated upon how clients or partners help design teams quickly understand the context and important issues in the project sector:

> We're able to get smart on a subject or area really quickly and we don't necessarily have to do all of this data mining on our own. Generally people that we work with are the experts, and we can build on their knowledge and also question them on some points that they think we shouldn't even touch (like prototyping in preschools, we can challenge that). But at least we know where they stand, and that gives us a little more wiggle room within these constraints. And within this body of knowledge, we have a little bit more time to poke holes. — IDEO.org Staff (S16)

A SmartLife designer points out that although sometimes it is beneficial for clients to indicate a promising direction for a project, they might not always be open to considering alternatives:

> There is a question about… Is the client biased because of that and are they really able to look at the market or the needs with truly open-hearts? I don't know, I'm not sure. I think in the case of SmartLife, it was the case because I actually felt my clients were particularly good. — SmartLife Designer (S21)

In comparison, IDDS projects come from a variety of sources (e.g., MIT D-lab courses, personal observations of IDDS organizers and participants, needs assessments in partner communities, etc.). IDDS organizers recognize the importance of problem validation, but as a volunteer organization, IDDS sometimes lacked the capacity and resources to properly vet projects:

> If you are asking me about 2009, there were preliminary visits. It is like one conversation or one group meeting. If you ask people, "Is tomato farming a problem here?" They will say that, "Yeah, it is problem. It is a big problem." That is not sufficient. So I think in those days, there was minimum validation. In those days, I think there was the kind of shoddy work that people teaching the IDDS curriculum would describe as shoddy work. — Former IDDS Organizer (S3)

> We really need to understand problems before we have the teams working on them, and there needs to be a certain amount of background research done. In 2012, […] we did a very cursory glance, and we looked at the one or two houses that the assessment team went to and saw that they weren't good. But then when they went in and looked around in the community, this project just was not applicable to this one community. […] It is just one of these things where if we don't do our homework enough, we are just making the teams spend a month trying to solve a problem that is not a problem or a well-defined problem. […] It doesn't make sense. The time investment we need to decide what good projects are or aren't should be a much stronger part of creating a summit. That is more important than the curriculum that we are designing or where we are staying or which community we are going to. — Former IDDS Organizer (S6)
> You need to understand how other projects have failed and how other projects have succeeded in a similar space, and you need someone who has a broad contextual experience in this space to say, "This is something that is worth approaching." — IDDS Organizer (S6)

As of November 2014, there had been ongoing efforts to better train IDDS organizers in problem validation and problem framing

Problem framing:

IDEO.org has professional full-time staff dedicated to properly scoping projects and crafting project briefs that will result in scalable and actionable results. Some of IDEO.org's clients also help define the design challenge:

> There are examples of partners who come to us, and they're pretty sure of, like "We should use videos as a way to engage farmers in best practices." […] We were given a pretty specific directive. Then, we were able to further it better than they could have, but without that, we would have probably started with four or five possibilities. We came to that conclusion pretty quickly. We did some quick research to make sure that was the best avenue, but because there was quite a bit of certainty on their behalf—they had been in the field and they had talked to the farmers—we just did a simple gut check, and then we were able to go a lot faster toward the right solution. — IDEO.org Staff (S16)

IDEO.org design teams also try to "gut-check" to see whether the client has identified the most promising direction:

> [Gut-checking] is hard to do without either interviewing a few different experts or going to the field and just giving yourself three days to figure this out, as opposed to what we would normally do, which is like two weeks of research. Like let's just see if this feels viable and go from there. — IDEO.org Staff (S16)

A SmartLife designer commented that a "tight brief" (focused problem framing with a clear direction) is beneficial when the project is time-constrained and resource-constrained:

> I think it's all about how big is the project, how much time and bandwidth do you have to do this. In a way, what worked out well, […] on SmartLife, is that we actually had a pretty tight [project] brief. It had already squared off and outlined what we going to do. For us, it was more about getting the details right. In a tight project, in which is resource-constrained, it makes a huge difference. — SmartLife Designer (S21)

In comparison, some of IDDS's project briefs were crafted by experienced lecturers from world-class engineering universities, and some were crafted by volunteers who may not have had training in properly framing design challenges:

> [IDDS Faculty, S2] and [the Director of IDDS] know what makes a good problem. But if you have an organizing team that does not have much background in problem identification and understanding, then that might be hard for them to look at a problem, really dig and understand that this is a good problem, or this a bad problem, or this has a good design space, or is this an implementation problem… Or is this a problem where there is a reasonable designable solution for it? — Former IDDS organizer (S6)

In addition, whereas IDEO.org tries to develop problem framings that will likely lead to project success, IDDS must also consider the potential educational value of the problem framing:

> Sometimes a problem that is framed really broadly is really a bad idea if your purpose is to get a product out the door by the end of the [IDDS] summit. But it would be really great if the idea were to have students really muck around for a while and really try to get their heads around something. It might be really frustrating in the longer path, but maybe they will learn more than someone who is given a really easy challenge. — IDDS Staff (S11)

In 2015, IDDS developed a set of training videos and guidelines to help new organizers learn how to frame design challenges in order to address both their design practice and design education goals. IDDS faculty members are also working closely with new organizers to provide expert review.

Project Champion:

With any project-based model, there must be a champion who can take the project forward to implementation:

> I would say [champions are] important but it's not just an IDEO.org thing. It's important in any project, any type of practice, whether its non-profit exclusively doing traditional grant-based work or a for-profit company. If you don't have a champion for a project, a project is not going to get done or a project will get done and sit on the shelf because you always need somebody internal who's going to push things forward. For me, that's just the way of the world of doing any project. I found the same thing when I was working exclusively in the non-profit grant-based world. If you didn't have someone on the other side, who wanted the project, the project's not going to move forward. I do think that is huge because at the end of the day, when you talk to about designers participating in things, designers can only do so much. Ultimately, it's at the discretion of whoever is responsible for putting the work into implementation to make things happen, whether it's a non-profit agency or a local community group on the ground. They're the ones who are going to be in charge of implementation, which is why it's important to bring them into the process early on so they understand it, and they can speak for it long after the designers left the room. — Former IDEO.org Fellow (S17)

For SmartLife, the clients were the project champions who ensured that the project progressed from the design stage to the pilot stage. IDEO.org considers several factors when selecting partners, including: direct connections to end users, deep experience in the project sector, an interest in HCD, demonstrated commitment and capacity to sustain and scale innovations, and a

clear vision and plan for achieving measurable impact (see Section 6.3.1 for details). A SmartLife designer emphasized the importance of having clients who are open to the HCD process:

> In the case of SmartLife, we were blessed with pretty enlightened clients that were either familiar with the design process or willing to come along for the ride. I found that clients that are not onboard with the methodology or don't believe in it or are not exposed to it had a lot of friction through the process which a lot of the time (aside from slowing you down), can actually impair your ability to successfully run the human-centered design project. — SmartLife Designer (S21)

In comparison, IDDS recognizes that project champions are important for continuity, but believes that champions cannot be assigned; either champions are the ones who propose the projects in the first place, or they emerge in the design process:

> It is not kind of thing where you go in and say you are the team captain and the success and the life of the project is in your hands. That is not how it happens. It is not how it happens in the community either. Ideally when you are choosing the communities you are working with, you find enthusiastic people and that's why you are choosing to work in those communities. But it's not like you are pre-assigning project champions. Usually this question is observational post talk. It is like, "Ok, looking at how things turned out in the last five weeks, who is more likely to continue it?" That is just programmatic help for IDIN. — IDIN Staff (S11)

Leveraging skilled local liaisons:

Translators play a critical role in helping the design team manage language and cultural differences:

> [At IDEO.org,] we now have a pretty good database of people that we work with in certain areas. So we have great translators in a number of places. We rely on our partners, who we've worked with in the past to connect us to different fixers who can, not only translate the language, but also the cultural norms for our teams, which is really important. […] These elements of the experience in the field are crucial to our success.
> We need to have excellent translators, and we probably need five of them because three of them won't be good. So there are things like that we've learned. You've got to line up the translators. We will interview them for like 10 minutes and three of them clearly won't work out. Because you need somebody who gets it and can quickly understand why we do things the way that we do and what leading questions are and that you're not going to ask them and you're going to exactly translate what we say verbatim and exactly translate what they say in response. Because the nuances are the crucial pieces of it. — IDEO.org Staff (S16)

The benefits of having skilled local liaisons are multiplied if the liaisons take on some of the responsibilities of the research team:

> When [IDEO.org design teams are] able to get [translators] to go out into communities and line up people for us to interview, that's crucial. I think when we're able to teach them our process and then send them out on their own so that they can return with more information, that's great. There are times when we've had them rent a kiosk or even operate as the kiosk owner to test out our ideas. Those are things that we can't do very well, as clear foreigners. So I think when you're able to leverage their knowledge of the communities and their connections [and] their network, those are some of the times where we have the best interviews, or have the best, most fruitful conversations. I think we've become better at leveraging those people. — IDEO.org Staff (S16)

Local liaisons might also contribute towards the creative process, ensuring that ideas and messaging are culturally appropriate:

> I think [an IDEO.org design team] had one idea of how you might want to talk to teens. [The local liaisons] quickly realized that was not the way to engage teens and told us how to do it better. That's just one example. When we had ideas about what all of the Diva role models should look like, we definitely put it in front of our teen connectors and made sure it resonated with them. They were part of getting us to even call it "Divas," because to us in America, "Diva" means something incredibly different than what it does in Lusaka. So having co-design sessions with them, where we're workshopping the language and messaging, is I think a piece of what pretty much every project does. — IDEO.org Staff (S16)

An unexpected yet beneficial outcome is that some of the translators hired for IDEO.org projects are then hired as permanent staff members for the implementation of the project. One of the translators for IDEO.org's SmartLife project was hired to lead SmartLife's sales team management and customer engagement strategy (SmartLife, 2015). An IDEO.org staff member commented on how translators have been hired as permanent staff for other projects:

> [For] our work with MSI [Marie Stopes International], where we knew that we couldn't go out into communities and talk to teens about sex, but we knew we could probably get a couple of 16 or 17 year olds to do it if we trained them and told them what to do and had a talk about these subjects, and send them out. Then we have more time to do other things and plan for the next day and create different prototypes, and then they report back to us. That's incredible. We're just multiplying our influence and impact that way. […] Those teen connectors that we identified are now employees of MSI [Marie Stopes International]. I don't think we would have identified that as a big piece of it had we not had to do it out of necessity because we didn't have enough time or enough people. And because a few of us were white and that wasn't going to work out [because the project was located in predominantly black communities]. So because of that experience of having to prototype it, we realized the value of it and the actual business of it. — IDEO.org Staff (S16)

In comparison, IDDS tries to ensure that community members are included in design activities to build local capacity for technology creation. All IDDS design teams are encouraged to plan how they will engage and involve local stakeholders throughout the design process. For Zimba, the inventor served as a local liaison between the team and communities near Kolkata, where prototypes were tested.

Team formation:

IDEO.org design teams are formed based on the skills and experience required to successfully complete a project.

> [The criteria for forming project teams] have a lot to do with what we're delivering. If it's a mobile technology, then we want to have an interaction designer on it. If it's a product, obviously an industrial designer. So that pretty quickly determines at least one of the team members. And it's great when we have one or two people with great design research chops. — IDEO.org Staff (S16)

When asked what is essential for a high-performing team, a former IDEO.org Project Lead emphasized diversity, craft (or expertise), and humbleness:

> Diversity of experience and craft and point of view. Everyone grows up in a different way and the way that you grow up and your value system actually plays into the way you interpret the world so I think diversity is really important there. Humbleness. Being nice. A lot of design work is around trusting each other's

> intuition, making big leaps of faith. Sometimes it's really hard work, and I think people that are fundamentally nice people and respectful and humble about their work and curious make for much stronger design teams because they are able to collaborate together much more successfully to better work. They're able to connect in a different way. The moment you have somebody who doesn't play along those lines, it breaks down a lot of the really creative problem-solving. It's a very delicate and fragile state and you need the right combination of people, and people's attitude and behavior can really make or break that environment. — Former IDEO.org Project Lead (S21)

> Different designers look and hear and interpret the same things in different ways. If you have an industrial designer looking at a problem sitting next to a graphic designer sitting next to an architect, they're hearing and noticing different things and also they're thinking about the solution in different spaces, and that's very productive. — Former IDEO.org Project Lead (S21)

Diversity in design teams may be conducive for innovation, but it also requires decision-making structures to address possible conflicts and channel the energy towards a unified vision. On IDEO.org design teams, a Project Lead sets the vision and direction for the project, and assigns roles or tasks to team members.

Since autonomy is a key criterion in IDDS's framework for creating transformative design experiences (see Section 5.4.3), IDDS design teams are formed primarily based on the participants' project preferences. IDDS also believes that innovation thrives at the intersection of diverse disciplines and cultures. IDDS teams may have team members that speak different languages, and have vastly different life experiences and expertise. Although a high degree of diversity may make it more challenging to develop and scale innovations if certain core competencies and operational structures are lacking, IDDS believes that diversity of life experience and culture may promote "mental shifts and emotional shifts and equality in the world" (S11):

> The philosophy of IDIN is that everyone can be innovative and the philosophy is to bring in diverse teams that represent a wide range of skill sets because we think in the intersection of these perspectives, lays innovation. We also think when you bring together people from different skill sets and different walks of life, really good things happen, not only good projects but also mental shifts and emotional shifts and equality in the world. So there is a philosophical underpinning — not only because better products come out of diverse teams but also a better world comes out. That is very carefully engineered.
>
> If you only think that the only purpose was to develop a series of really great amazing products, then we might target a little differently. We would bring in the best business people, the award winning designers and people with a million dollars who can scale something all by themselves. If the only objective was to scale amazing products, then that is how we would target — only bring in the top, most brilliant.
>
> But I don't think that is the point because it is about the people too. And we believe that better innovation comes out of better involvement. We do try to target people with entrepreneurship experience and business experience but we don't want to only target those people because we think that bringing in people with anthropology backgrounds and farming backgrounds and bike repair backgrounds is going to be just as valuable as the people who have been entrepreneurs in the past. — IDIN Staff (S11)

Implementation Plan and Follow-Up Support:

IDEO.org delivers an implementation plan along with the design object, plans for check-ins at critical moments, helps partners resolve implementation issues as they arise, and generally develops a close long-term relationship with partners:

> A big piece of it is not just delivering a product, service, or experience, but also delivering an implementation plan or a plan for pilot. I think that's something that we've learned over the course of the past three years. It's not necessarily something that we always did, but I think we're seeing growing demand for it. Just out of necessity of wanting to see our work actually go out into the world, we can't just hand over this shiny new object without really… A small grassroots organization that's never had a new product or doesn't really know how to roll out or launch a new offering, so I think we've seen more demand for creating a step-by-step program for how to do that. In addition to that, it's not just a 10- or 12-week project. There are check-ins. So we need to reach out to our partner organizations when they're in these critical moments. Those are just things that we can schedule for and plan for when we hand off an implementation plan. I think that ensures that they feel well equipped to carry the work out. It also keeps us close to them and we're able to track their progress. We're also able to ensure that if there is follow up work, or if we misstep in some way, we can work to resolve it with our partner, as opposed to it just falling dead in the water. I think all of those check-in calls and creating really close relationships with our partners have ensured that a lot of our projects have been pretty successful. — IDEO.org Staff (S16)

For example, IDEO.org's SmartLife team designed the service as well as an implementation plan. The implementation plan included components such as the financial model, design of the retail space, and brand. The brand was notably critical for building credibility during prototyping. SmartLife's aspirational brand appeals to people's desire for prestige and convenience rather than making a case for health, which is a common strategy for many water and health-focused programs. IDEO.org's Creative Director emphasizes the importance of branding in every project, because it increases the credibility of the offering:

> We found that brand is a necessity in every single thing that we prototype because consumers really do demand it. If we want them to believe that our offer is credible, that there are people behind it, that there has aspiration for life change, it needs to look serious. Part of my journey around this work is the first brand project that we were doing here. We were working in Ghana, and the team was really stimulated by the hand-painted signs, and the beauty of the visual fabric of the city, and responded with things that felt very crafty and lovely. And we went to test them, and people were like, "No, no, no. This looks like something that got made in the store next door. What we want is to feel like there's some real power, and there's some real change." So it's been interesting to design brands. And to design offers in parallel right from the start. And this is pushing us to act differently. — Patrice Martin, IDEO.org's Creative Director (Martin, 2012)

In this chapter, I identified factors that potentially influence the successful progression of a project from the design stage to the pilot stage. These factors were identified through an analysis of the SmartLife and Zimba projects. Additional research is needed to determine whether these factors demonstrate a significant influence in other project case studies. Moreover, the real challenge for the field of HCD for Social Impact will be scaling up successful solutions. At the conclusion of this research study in 2015, the SmartLife and Zimba projects had not yet transitioned from early adoption to scaling up. The next chapter will summarize the major findings of this research study and conclude with potential directions for future research.

Chapter 8

Conclusions

In this dissertation, I presented two models of the application of Human-Centered Design (HCD) for Social Impact. With IDEO.org's Project-Based Consulting Model, professional design teams partner with social sector organizations to design scalable products and services. With the International Development Innovation Network (IDIN) Creative Capacity Building Model, students and community members from low-income communities learn to design appropriate technologies and launch social enterprises through an educational conference. I described the evolution of exemplary programs developed by these organizations, provided an overview of how organizational context influences the HCD process, and analyzed in-depth project case studies for each program. The following sections summarize major findings.

8.1 Strategic Fit and the Alignment of Mission with Core Competencies

Using the Social Blueprint framework in Chapter 3, I characterized the mission and structure of IDEO.org's Fellowship program and of the International Development Innovation Network (IDIN) International Development Design Summit (IDDS) program. As these programs were developed through strong partnerships with existing organizations (i.e., IDEO in the case of IDEO.org; MIT and other universities in the case of IDDS), several building blocks of their Social Blueprints were heavily influenced and somewhat predetermined. IDEO.org's partnership with IDEO provided competitive advantages in achieving their design practice goal of developing innovative products and services to increase the impact of their social sector partners. In particular, IDEO provided IDEO.org with seed funding (Revenue Stream), a strong brand (Differentiation), and professional designers (Key Resources) with expertise in IDEO's particular approach to human-centered design (Key Activity). IDDS's partnership with universities provided competitive advantages for achieving their design education goal of inspiring and empowering students and members of low-income communities as social innovators. Through these partnerships, IDDS was able to recruit instructors with expertise teaching design, engineering, and international development and students who volunteered to organize IDDS conferences (Key Resources). Based on their expertise, IDDS Faculty developed the IDDS curriculum to teach their particular approach to human-centered design that emphasizes co-creation with low-income communities (Key Activity).

In the literature on organizational strategy, the concept of strategic fit suggests that the structure of an organization or program and the pattern of decisions and actions undertaken must

be consistent with the direction or mission of the organization and integrated with one another to support a successful competitive advantage (Day, 1984; Hayes & Wheelwright, 1984). Despite the shared emphasis on the HCD process (Key Activity), my analysis of IDEO.org and IDDS suggests that all building blocks of an organization's or program's social blueprints must be aligned to achieve its mission or anchor purpose. Since IDEO.org and IDDS grew out of existing organizations, their building blocks were significantly influenced by their founders and parent organizations. The mission and pattern of decisions and actions undertaken by IDEO.org led to outcomes supporting their design practice goal whereas those of IDDS led to outcomes supporting their design education goal. As of November 2015, 38.5% of the 64 projects IDEO.org completed from 2011 to 2015 were in the market (IDEO.org, 2015c, p. 23). This proxy indicator suggests that IDEO.org was achieving some success with the design practice aspect of its mission. Based on anecdotal evidence from IDDS participants' self-reports, IDDS appears to be successfully achieving its capacity building mission. Several IDDS participants claim that IDDS stimulated a transformational change that led to their involvement in international development, designing technologies, launching social enterprises, or teaching design and entrepreneurship (see Section 1.3).

8.2 The Challenge of Striving for Impact Through Both Design Education and Practice

Although IDEO.org was better positioned to succeed in design practice and IDDS was better positioned to succeed in design education, both had multifaceted missions of achieving impact through design practice and design education, which created challenges for each. My analysis of IDEO.org's Fellowship program and IDIN's IDDS program suggests that it is challenging to achieve the goals of design education and design practice with a single standalone program. There are intrinsic tradeoffs in managing such programs with regard to forming design teams, selecting and directing design projects, and determining the appropriate level of stakeholder participation in the design process. For example, design education programs target novice designers or people unfamiliar with design to increase their creative capacity. However, the group of learners inevitably graduate from the program and leave at the peak of their performance. Retaining organizational knowledge may be challenging with transient design teams. In contrast, programs aimed at achieving impact through design practice would ideally hire professional designers. Designers in full-time salaried positions would be able to enhance their expertise through project experience and increase the organization's capacities over time.

It is also quite challenging to identify projects with a high potential to produce scalable solutions, and that simultaneously are well-suited to teaching the design process to novices. Developing scalable products often requires advanced skills, such as manufacturing, market feasibility assessment, supply chain management, or branding. On the other hand, early-stage user research, concept development, and prototyping may be a more suitable for teaching novice designers the general design process. Novices can interact with users to identify user needs, brainstorm ideas, and build rudimentary prototypes. In addition, in order to facilitate learning, design teams would ideally have autonomy in selecting projects and determining the direction of their projects. However, novices may not have the skills to identify the most promising direction for impact. On the other hand, if the priority is design practice, the design team's educational interests and needs may not be adequately met.

Furthermore, a co-creative design process that engages stakeholders in creating solutions promotes local capacity building in low-resource communities. However, enabling stakeholders from low-income communities to develop products and services requires significant infrastructure and support (e.g., additional training, funding, access to prototyping tools and facilities, etc.). On the other hand, partnering with established organizations with the ability to implement at scale can facilitate the rapid launch of new products or services, but may not build local capacity for innovation.

Although IDEO.org and IDDS faced similar dilemmas related to having multifaceted missions, they chose different strategic paths. IDEO.org developed new programs focusing either on design education or design practice, whereas IDIN integrated the IDDS program with other resources and initiatives to better support a multifaceted mission. What follows is a summary of the evolution of IDEO.org and the evolution of IDDS.

8.2.1 IDEO.org's Evolution

Chapter 4 describes the evolution of IDEO.org's Fellowship program, and the development of new programs with more focused missions. IDEO.org's Fellowship program was a one-year apprenticeship, in which social sector leaders learned HCD by working on consulting projects led by professional designers. The Fellowship program aimed to design exemplary products and services that partner organizations could implement at scale.

In 2015, IDEO.org decided to discontinue the Fellowship program. Rather than try to achieve the mission of design education and design practice through a single program, IDEO.org launched new programs and initiatives that were optimized to achieve impact through either design education or design practice. To achieve the design education aspect of their mission, IDEO.org developed new educational programs, including the +Acumen HCD Massive Open Online Course (+Acumen, 2013) and the Design Kit online platform to teach HCD methods (IDEO.org, 2015a). To better achieve their mission of designing exemplary products and services, IDEO.org transitioned from short-term consulting projects to developing long-term partnerships in programmatic focus areas. By working closely with partners throughout the design process and teaching them HCD principles, the partners had more buy-in and could use HCD to help resolve issues in future work. IDEO.org also provides design support through a series of consulting projects and follow-up support throughout implementation.

One of IDEO.org's key lessons learned from the Fellowship program revolved around the theme of strategic focus. When the Fellowship program was launched, IDEO.org worked across several project sector areas including water and sanitation, agriculture, health, financial services, gender equity, and community building (IDEO.org, 2015g). Transitioning from the Project-Based Consulting Model to the Programmatic Model with long-term partnerships, IDEO.org focused on teen reproductive health and financial inclusion. Focusing enabled IDEO.org to develop its expertise in these program focus areas, contribute more design support during implementation, and build HCD capacity in the reproductive health and financial inclusion sectors.

As IDEO.org shifted its priorities and mission, various aspects of the Social Blueprint needed to shift accordingly. In particular, the skill and expertise of the design team are Key Resources in the HCD for Social Impact field. Initially, IDEO.org recruited Fellows who had both social sector and design experience, but few people had deep expertise in both areas (IDEO.org staff, S16). Eventually, IDEO.org shifted towards recruiting Fellows who either had deep expertise in the social sector or were "amazing designers" (IDEO.org staff, S16). Moreover,

by the end of the one-year Fellowship program, the Fellows were working effectively, but then it was time to leave IDEO.org. These annual transitions made it challenging to maintain organizational knowledge. With the new Programmatic Model, IDEO.org hired full-time permanent designers who could more fully develop their expertise in HCD for Social Impact.

According to the resource-based view of strategy, organizations gain competitive advantages by developing resources (Key Resources) and capabilities (Key Activities) that are valuable, rare, and inimitable (Hayes and Pisano, 1996). Capabilities are the processes, activities, or functions that enable an organization to achieve a particular end result; they are developed through a firm's experience, focus, and effort over time (Lowson, 2002). IDEO.org's evolution demonstrates the development of unique capabilities and competitive advantage through strategic focus.

8.2.2 IDDS's Evolution

Chapter 5 describes the evolution of the IDDS program, the rationale for maintaining a multifaceted mission, and the changes IDIN has made to better support its design education and design practice goals. IDDS was initially a standalone program with a mission of "empowering people to make a change in the world" (IDIN Staff, S11). In 2012, a $20 million grant from USAID enabled the formation of IDIN as an organization with a larger mission of launching and supporting "a global network of innovators to bring technologies that solve problems in poverty to scale" (IDIN Staff, S1).

Based on interviews with IDDS faculty and staff, I developed a visualization of IDDS's strategy for creating and empowering social innovators (see Section 5.4). The three main components are the curriculum, the culture, and the participant experience. In theory, if the curriculum and culture are changed, the event would still have a transformative influence but the skills, knowledge, beliefs, and values transferred would be different.

IDDS's participant experience produces two types of transformations: (1) a series of experiences that form a rite of passage into a social innovation tribe, and (2) a design experience that increases design self-efficacy. The IDDS conference offers many intense experiences and serves as a crucible for transformation. For example, immersion in a new environment dedicated towards achieving an altruistic goal causes people to question their life path (Former IDDS organizer, S3). Living and working with a diverse group of people who share a common passion for social impact catalyzes empathy and forms strong social bonds that continue beyond the IDDS conferences (IDDS faculty, S2). IDDS participants also learn and practice a particular approach to international development that emphasizes the co-creation of technology. Through the IDDS conference, participants adopt the practices and values that define membership in the IDIN Network, a social innovation tribe. The strong bonds and shared values of the tribe reinforce and support IDIN Network members' commitment to social innovation.

The second type of transformation is a design experience that increases design self-efficacy. IDDS projects are the main vehicle for delivering a transformative design experience. Crafting a transformative design experience entails finding harmony between various criteria in tension. The design experience must feel authentic, in that it is real and meaningful. For IDDS, authenticity means being engaged with a community in creating something of potential benefit to that community. It is also important for the learners to have autonomy and to be able to exercise some control over their actions and the trajectory of the project, especially among the constraints and complexity of the real world. The design experience must be challenging to stretch the learners to grow, but it must also be possible to make significant progress and to achieve some

level of success. IDDS faculty members also believe that the design experience must be hands-on and experiential to create a transformative effect (IDDS faculty, S2).

Although IDDS's priority is inspiring and empowering people to be social innovators, IDDS believes that it must maintain a dual mission of empowering social innovators and developing social innovations. In order to obtain funding to empower social innovators, IDDS believes that it must demonstrate the potential to develop innovative products (Former IDDS organizer, S3). Moreover, the participants' educational experience, dedication to social innovation, and engagement with community members are tied heavily to design practice. IDDS's educational model is based on learning-by-doing with projects as a vehicle for learning. In addition, working on projects with the potential to benefit low-income communities is an important component of the personal transformation that inspires IDDS participants to become social innovators. IDDS's particular approach to HCD also emphasizes co-creating technology with stakeholders from low-resource communities. Thus, IDDS undertakes projects that facilitate collaboration with community members and show potential for positive social impact.

IDDS believes that a pathway for sustainable development is to create and support a global network of social innovators, who will eventually develop scalable innovations. The timeframe for such work is likely to take several years since IDDS starts with early-stage concepts and aims to develop products in low-resource environments. Moreover, since most participants in the IDDS program are undergraduate students or community members from low-resource areas, significant training in HCD, engineering, and business is needed to build their capacity to develop scalable products.

In 2015, as I am concluding this research, IDIN was evolving the IDDS program to better address a shift in its mission to design *scalable* products. This shift in mission raises questions for what may need to change in IDDS's program structure or Social Blueprint. For example, IDDS is experimenting with shorter regional conferences focused on thematic areas, such as waste management or medical devices, so they can recruit participants with expertise in their project sector. IDDS has also been increasingly recruiting participants with business experience. These changes in participant recruitment strategies are essentially changing IDDS's Key Resources from consisting primarily of experienced instructors and design facilitators towards developing design teams with business and sector expertise.

In addition, IDDS is being integrated into IDIN's Social Innovation Ecosystem, which offers additional programs and resources to provide continued training, mentorship, and funding for IDDS alumni and their projects. For example, the IDDS conference is linked with D-lab courses, in which student teams help to further develop IDDS prototypes. IDIN has also developed a funding pipeline with grants ranging from $30 to $20,000 to help social innovators further their projects. IDIN also connects former IDDS participants to mentors and additional team members in its network. These additional Key Resources and Key Activities are putting IDDS in a position with greater potential to achieve its new goal of producing scalable products.

Although IDIN is still in the process of developing improved programs and resources to scale up new products, IDIN has successfully scaled up IDDS as a design education program. As of October 2015, IDIN had over 600 Network members (J. Repishti, personal communication, October 8, 2015). As IDDS scales up its program to reach more participants, IDDS faculty are giving volunteers and first-time organizers more autonomy in planning IDDS conferences and modifying the curriculum. In order to enable new organizers to replicate IDDS conferences and their transformative effects, IDDS faculty and former organizers concretized and developed training materials for organizing IDDS conferences.

8.2.3 Common themes in IDEO.org's and IDDS's Evolution

IDEO.org and IDDS evolved through different trajectories, but also exhibited some common themes. Initially, IDEO.org and IDDS worked across multiple project sectors, but both eventually narrowed the focus of their programs. With IDEO.org's Project-Based Consulting Model, projects spanned the sectors of water and sanitation, agriculture, health, financial services, gender equity, and community building (IDEO.org, 2015g). With IDEO.org's Programmatic Model, projects focused on teen reproductive health and financial inclusion. Similarly, from 2007 to 2012, all IDDS conferences addressed a diverse array of projects in sectors including agriculture, water and sanitation, in-come generation, information and communication technology, etc. Starting in 2013, IDDS began experimenting with themed summits, with topics such as waste management or maternal and child health. Focusing enabled both organizations to recruit people with more specialized skills and expertise in the thematic topic areas. In theory, people with increased domain expertise can help guide projects towards the most promising solutions, taking into consideration the context of the sector.

Design project timelines initially spanned from four-weeks for IDDS to twelve-weeks for IDEO.org. These short timelines can begin to identify promising directions and concepts, but more time and resources are needed to fully develop products, services, and programs. Both IDEO.org and IDDS increasingly developed more ways to provide long-term support for follow-up over multiple years. With IDEO.org's Programmatic Model, IDEO.org partnered with implementing organizations for yearlong or multi-year initiatives, which included multiple design projects and design support throughout implementation. For IDDS alumni, IDIN provides access to additional resources, such as microgrants, mentorship, technical support, and prototyping facilities.

In order to multiply their impact beyond those that directly engage in their programs, IDEO.org and IDDS developed and shared free resources publicly to create a larger movement of HCD for Social Impact. IDEO.org design teams regularly write blog posts about their project experiences and lessons learned. IDEO.org also developed the Design Kit of HCD mindsets, methods and case studies that is available online, in print, and in PDF format (IDEO.org, 2015a). In collaboration with +Acumen, IDEO.org also developed a "Massive Open Online Course" (MOOC) on Human-Centered Design for Social Innovation and a MOOC on Prototyping (+Acumen, 2015a; +Acumen, 2015b). Similarly, IDDS Faculty developed a guidebook for organizing IDDS conferences and training videos for design facilitators that are all available online (IDDS, 2015a; IDIN, 2015b). IDIN also posts IDDS curricula materials, project presentations, and project reports online (IDDS, 2014; IDIN, 2015d).

Both organizations emphasized the importance of imparting HCD mindsets and values, in addition to introducing people to the design process and methods. HCD mindsets include principles such as developing empathy for users, embracing ambiguity, testing ideas through tangible experiments and interactions with users, and iterating to evolve a more robust and promising solution (IDEO.org, 2015a). Some values that IDDS hopes to impart upon participants include being open-minded, leveraging diversity, and appreciating the expertise of users (see Section 5.4.2). As HCD is not a static process, but is ideally adapted to different contexts, it is important to have guiding mindsets or values that shape the practice of designers.

8.3 The Influence of Organizational Context on the HCD Process

In Chapter 6, I analyzed IDEO.org's and IDDS's distinct approaches to design. Both approaches exhibit characteristics typical of HCD. In particular, both approaches emphasize the importance of engaging with users to understand their needs and priorities. Design teams ideate many ideas and gather feedback from users on prototypes. They also sometimes reframe the problem based on insights gained during user research and prototyping. Although IDEO.org and IDDS both practice HCD, IDEO.org's decisions appear to prioritize the mission of designing exemplary products and services whereas IDDS's decisions appear to prioritize the mission of empowering and supporting a global network of social innovators.

The participatory philosophies of IDEO.org and IDDS also seem to influence the way that design teams engage with stakeholders in the design process. According to former IDEO.org Fellows, designers are trained to seek inspiration from the environment and users, infer user needs, and deliver solutions that meet the needs of clients and users (S17, S21). Designers are portrayed as visionaries with an expert intuition that enables them to create solutions with deep emotional meaning. They have also developed a craft that enables them to express visionary concepts in compelling and tangible ways (S21). IDEO.org design teams tend to engage more with users when gathering information and getting feedback on concepts, but might not involve users in activities that require design skills (IDEO.org staff, S18). Alternatively, IDDS believes that anyone can become an active creator of technology (Taha, 2011, p. 3). The Director of IDDS believes that the process of creating technology produces a sense of accomplishment and increases people's confidence in their ability to control their lives (Smith, 2015a). Moreover, IDDS believes that building capacity for innovation and creativity is critical for sustainable development (IDDS, 2013). IDDS design teams are encouraged to foster opportunities for co-creation (design with users) and user-created design (design by users) by trying to engage users in all aspects of the design process. However, IDDS also acknowledges that there are situations in which expert-led design (design for users) is more appropriate.

The HCD process is not a rigid and static process. Several aspects of the HCD process are influenced by an organization's mission and context. For example, the project selection criteria are influenced by IDEO.org's Project-Based Consulting Model and IDDS's Creative Capacity Building Model. IDEO.org selects projects and partners with high potential for achieving measurable impact, whereas IDDS selects projects that are conducive for teaching the design process to novices and inspiring participants to dedicate themselves to social innovation. Although IDEO.org and IDDS may use similar methods (e.g., observations and interviews), their relationships with stakeholders are influenced by their respective organizational missions. IDEO.org design teams maintain a professional interaction with stakeholders with the primary goal being the success of the project. IDDS design teams try to develop long-term relationships with stakeholders and prioritize building local creative capacity over immediate project outcomes. Decision-making protocols and procedures also appear to be influenced by the mission and values of the organizations. IDEO.org tends to rely upon expert-review and the approval of clients to determine the direction of projects. IDDS tries to give design teams as much autonomy as possible in decision-making regarding their projects. IDDS teaches systematic metric-based methods for concept selection rather than relying on expert-review to enable participants to practice design independently after they complete the IDDS program.

8.4 Factors Influencing Success in Progressing from Design to Pilot

In Chapter 7, I analyzed in-depth project case studies from the IDEO.org Fellowship program and the IDDS program to demonstrate how strategic decisions at the programmatic level may influence the trajectory of projects. Based on these project case studies, I also identified factors that influence the likelihood of projects moving successfully from the design stage to the pilot stage. Although HCD is often touted as the key to successful innovation, these project case studies suggest that there are additional success factors related to strategic decisions at the programmatic level, such as problem framing, design team formation, and the identification of a project champion.

IDEO.org's SmartLife project and IDDS's Zimba project both aim to provide clean drinking water. SmartLife focused on developing a scalable business using commercially available technology. Zimba focused on developing a device to automatically chlorinate batches of water. The problem framing heavily influenced the trajectory of these projects. Problem framing defines a realm of possible solutions. HCD is an iterative process for exploring the solution space. However, if the problem framing is off-target, the solution space may not address the root of the problem unless the problem is reframed.

Another possible error in problem framing is improper scoping. The problem framing might be too large in scope, in which case, there might not be adequate time or resources to identify an appropriate solution. Alternatively, the problem framing might be too narrow in scope, in which case, the solutions explored may be too limited. SmartLife was initially framed as a business that provides water alongside hygiene and nutrition products. The design team reframed the problem to address the most pressing need of clean water. This reframing resulted in a shift to designing SmartLife as a business that primarily provides water, and leverages relationships with customers to sell hygiene and nutrition products. Zimba's problem framing was relatively narrow, specifying the particular technical mechanism of chlorinating batches of water. This problem framing limited the realm of solutions explored, and other water treatment mechanisms were not considered. Additionally, the focus on technology meant that the business model was not developed alongside the technology. Zimba's challenges are largely related to the lack of proven business model.

IDEO.org and IDDS also had different criteria for forming design teams. IDEO.org formed design teams based on the expertise needed to deliver the best design. IDDS formed teams to maximize diversity of life experience and the potential for emotional and mental shifts (IDIN staff, S11). Although this diversity was crucial for inducing personal transformations, it contributed to logistical challenges and slowed progress on the project. Zimba struggled with team management after the IDDS conference because most team members were part-time volunteers working in five different time zones.

In order for any endeavor to sustain momentum, there must be a champion or group of champions who are ensuring that the project continues to progress. IDEO.org selectively partners with people and organizations with the resources and expertise to successfully implement at scale. The SmartLife team involved their clients in the design process to facilitate buy-in for implementation. The champions of IDDS projects tend to be students or members of low-resource communities. IDDS project champions struggle to find resources and develop the expertise needed to implement projects at scale.

For further analysis of the SmartLife and Zimba project case studies, I introduce various frameworks and tools that may be useful for other educators and practitioners in the field of HCD for Social Impact. The Ten Types of Innovation framework provides guidance for the different ways in which an organization may innovate (Keeley et al., 2013). It provides some indication of whether the design challenge or project brief is framed too narrowly, as to limit the types of innovation the design team is likely to consider. I also developed a scale to assess the Levels of Stakeholder Influence, based on work by Harder et al. (2013). The scale is intended to clarify which stakeholders participated in each stage of the design process and their respective levels of influence in decision-making. The Impact Optimization Quad may help organizations clarify their relative prioritization of achieving social impact or financial returns (Calderon, 2014a). The five-point scale of deployment complexity (Buluswar et al., 2014) may help in identifying the most challenging aspects of deployment before significant investments are made in the intervention.

8.5 Future Research

This research is an exploratory case study of HCD for Social Impact. The goal of an exploratory case study is "to develop pertinent hypotheses and propositions for further inquiry," (Yin, 2008, p. 9). This research has presented several important directions for future research in HCD for Social Impact.

8.5.1 Comparative analysis of IDEO.org's and IDDS's strategies for design practice and design education

In this dissertation, I described the evolution of IDEO.org's Fellowship program and IDIN's IDDS program. Although IDEO.org and IDIN had similarly multifaceted missions, I focused my analysis on each organization's forte. I explored IDEO.org's strategies for achieving impact through design practice and IDIN's strategies for achieving impact through design education, particularly IDDS's strategy for creating and empowering social innovators. As such, this research study was structured as a *single case study* of IDEO.org (Chapter 4) and a *single case study* of IDDS (Chapter 5).

Future research could develop a *comparative two-case study* of IDEO.org's Fellowship program and IDIN's IDDS program, analyzing impact through both design practice and design education. Did IDEO.org's Fellowship program have a transformative effect on the Fellows? If yes, what type of transformation occurred (e.g., changes in knowledge, skill, beliefs)? What were the strategies for achieving this transformation? In addition, how did engaging with IDEO.org influence client or partner organizations? Have partner organizations adopted some of the mindsets, methods, or process of IDEO.org's particular approach to HCD? How does each organization define and measure social impact? Which strategies were successful in supporting the continuation and scalability of products? Are there common strategies used by both organizations?

8.5.2 Deeper exploration of the influence of design education on the creation and empowerment of social innovators

IDDS posits that diversity is critical for innovation and the transformation of IDDS participants into social innovators. Future research may explore what types of diversity (e.g., discipline, cultural, geographic, etc.) and how much diversity is beneficial for catalyzing innovation. What is the limit to which more diversity leads to conflicts and operational challenges that outweigh the benefits? Similarly, it would be interesting to explore what types of diversity and how much diversity is needed to stimulate the transformations IDDS aims to achieve, and whether certain types of diversity (e.g., language, access to internet, etc.) limits certain individual's ability to fully engage in the educational program or connect with participants in the program.

IDDS believes that exposing people to the design process expands their capabilities and changes their view of their self-efficacy and agency. In particular, future research could investigate the effectiveness of IDDS's strategy for creating and empowering social innovators (see Section 5.4). IDDS has anecdotal evidence from self-reports of participants attributing a personal transformation to their experiences at the IDDS conference or as part of the IDIN Network. For example, after IDDS, a Tanzanian bicycle mechanic invented a solar-water heater and a pedal-powered drill press, blender, hacksaw, and cell phone charger. He and several other IDDS participants have also started design education programs and technology innovation centers in their communities. To my knowledge, I have not found a standard evaluation framework for assessing the impact of a design education on personal transformation. An evaluation framework assessing the knowledge, skills, and beliefs of learners pre- and post-design experience would be useful not only for IDDS, but for other design education programs aiming to produce personal transformations. An evaluation framework would help us improve design education programs and potentially identify which components of the programs are contributing more strongly towards positive outcomes.

In theory, the democratic and participatory ethos of IDDS can challenge societal hierarchies that typically hinder interactions between members of different social groups. For example, despite their limited formal education, artisans (e.g., welders, carpenters, mechanics, etc.) may demonstrate their innate ingenuity and teach fabrication skills to academics and professionals. There may also be greater potential for transformation for female participants since gender roles in some cultures associate technology with masculinity. In addition to women realizing their ability to create and use technologies, some IDDS technologies (e.g., grain threshers and mills) have the potential to shift the division of labor from women's manual labor to men's automated tasks. Future research could test the validity of these hypotheses and further understanding about the outcomes of an experience like IDDS.

IDDS has been experimenting with different formats for the conference. There are one-week and two-week conferences in addition to the original five-week conferences. Although the original IDDS conferences were more globally diverse with projects in a variety of development sectors, some IDDS conferences are currently focused on thematic areas (e.g. waste management) or particular populations. By comparing these different formats (e.g., the thematic areas, the activities, the length, the location, etc.) and their respective outcomes, we may be able to determine which aspects of the programs contribute towards positive outcomes. This analysis could be complemented with a qualitative study comparing the differences between people in the IDIN network who continue to work in social innovation and those who do not, and the self-reported reasons for their decisions.

In addition to changing the format of IDDS conferences, IDIN Network members have created workshops, training centers, and course curricula based on the IDDS curriculum. The differences between these education formats and outcomes for learners could also be further researched. In addition to researching what type of transformation is occurring and what is contributing towards the transformation, future research could investigate the transferability or scalability of IDDS's approach. If new organizers follow the guidelines for creating design experiences by providing authenticity, autonomy, a challenge, and support for success, do participants self-report comparable transformations as those who had attended the original IDDS conferences?

Going beyond IDEO.org and IDDS, future research could analyze other types of organizations or programs that are using design education as a means to inspire and empower social innovators. For example, there are design and social innovation courses offered in graduate schools or professional degree programs. IDEO.org's Fellowship program focused on teaching HCD to social sector leaders, and IDDS focused on teaching HCD to undergraduate students and community members. How might factors, such as different educational formats or different learner profiles affect the curriculum or program outcomes?

8.5.3 Comprehensive investigation of factors influencing project success

In this dissertation, I developed in-depth project case studies of an IDEO.org project and an IDDS project that these organizations publicly-reported as being examples of successful projects. Based on interviews with key informants and various analytical frameworks, I identified potential project success factors. It was beyond the scope of this research study to test whether the success factors identified correlated with project success.

Future research analyzing project case studies could identify additional success factors. By comparing projects that these organizations reported as successful with those they reported as unsuccessful, we may also analyze whether the successful projects exhibited a higher prevalence of project success factors than unsuccessful projects. We may also uncover other potential success factors that are shared among successful IDEO.org projects or among successful IDDS projects. There is history of studying product success and failure that could form the basis for this work (Bacon, Beckman, Mowery, & Wilson, 1994; Freeman, Robertson, Achilladelis, & Jervis, 1972; Maidique & Zirger, 1984; Rothwell et al., 1974).

Extending the project analysis to include more projects may also test the usefulness and limitations of the frameworks utilized in this study. Does the specificity or breadth of problem framing influence which Ten Types of Innovation are undertaken? Do successful projects tend to demonstrate more types of innovation than unsuccessful projects? Do successful projects also demonstrate a lower level of deployment complexity? Can Buluswar's five-point scale of deployment complexity be used to assess the feasibility of proposed solutions? Can Buluswar's five-point scale of deployment complexity be used to identify potential barriers to implementation?

I have worked with a team of undergraduate researchers to conduct preliminary research on ten projects that IDEO.org has publicly reported as reaching pilot stage or early adoption. We have qualitatively analyzed publicly available information, such as the design teams' blog posts and excerpts from project reports. We have categorized the proposed solutions using the Ten Types of Innovation framework. Further analysis is needed to determine whether there are any patterns in the strategies used for each type of innovation. We have also collected data on the types of stakeholders involved in the design process and their roles for the ten projects that

IDEO.org reported as piloted. For projects in which IDEO.org design teams have outlined design principles, we have begun to identify common strategies, such as using branding to gain trust and creating delightful experiences. This analysis of publicly available blog posts and project reports can be complemented by interviews with IDEO.org designers.

Going beyond IDEO.org and IDDS, future research could develop a standardized framework for assessing the success of HCD for Social Impact projects. Exemplary projects could then be identified based on standardized criteria, and commonalities and differences could be analyzed to develop additional hypotheses about project success factors. As scaling up is crucial for maximizing social impact, future research should investigate factors associated with projects advancing from early adoption to scale. This research study focused on factors influencing the progression of projects from the design phase to the pilot phase since IDEO.org and IDDS have the most significantly influence during the design phase.

8.5.4 Further analysis of the challenges associated with the multifaceted mission of design education and design practice

In this dissertation, I described the challenges faced by IDEO.org and IDDS in striving for impact through design education and design practice. Future research could expand this analysis to other organizations or programs with dual goals involving design education and design practice. We could investigate whether they face some of the same challenges encountered by IDEO.org or IDDS, and how they are addressing those challenges. For example, how does the program manage loss of organizational knowledge or skill if there is continual transition among the group of learners? How does the program manage the need for longer-term support during implementation? How can design novices contribute effectively towards developing impactful and scalable products? How does the program manage trade-offs between what is beneficial for education versus what provides the greatest potential for developing scalable products?

With the emerging field of HCD for Social Impact expanding and maturing, there is more to be researched. This dissertation has contributed to our understanding of two models for HCD for Social Impact. Based on my analysis of the organizations and projects in this study, I have identified challenges associated with striving to achieve impact simultaneously through design education and practice. I have demonstrated that the HCD process is influenced by organizational context. I have also presented theories about how design education has the potential to facilitate personal transformation and identified challenges and success factors influencing the likelihood of project success.

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