Toward Better Design of Humanitarian ICT:

A Social Agency-Centered Framework of Humanitarian Information Needs

Based on a Grounded Study of Successful Red Cross/Red Crescent Practitioners

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A dissertation

submitted in partial fulfillment of the

requirements for the degree of

Doctor of Philosophy

University of Washington

2018

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Program Authorized to Offer Degree:

Human-Centered Design and Engineering

University of Washington

Abstract

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Meaningful and relevant design of humanitarian technology must be informed by a deeper understanding of information practices found within successful humanitarian field-work. Existing largely in geographic isolation and through implicit expertise, these practices have yet to be adequately articulated. This research reveals hidden practices of peer-identified, successful International Red Cross/Red Crescent Movement (RCRC) practitioners in order to inform more effective design of humanitarian information and communication technology (ICT). The results draw from the qualitative analysis of 116 practitioner interviews and ethnographic observations across six countries and multiple contexts. From their stories of success and failure, I distill a grounded theory of information practices for successful outcomes within humanitarian resilience work. This paper presents a theoretical framework for depicting relevant information needs of field-level practitioners, and how that information is accessed and applied within a "Wheel of Successful Practice." The outer wheel depicts (1) community trust, (2) community organization,

(3) community agency, and (4) long-term impact as four, high-level, information essentials practitioners' identified they "Must-Have" for success. The inner wheels consist of 11 Success Factors and 30 Information-Driven Behaviors repeated across contexts for achieving those Must-Haves. These results uniquely identify (1) social agency as the place where critical information resides, and (2) community discourse and community-practitioner interactions for how that critical information is revealed. Thus, the Wheel of Successful Practice identifies that information needs reside within social interactions. My findings challenge technology developers and designers—in alignment with emerging trends in human-centered design and engineering—to innovate for greater participatory and sociomaterial methodologies to account for the exigencies of humanitarian values within the design humanitarian ICT.

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I. Introduction

A. Humanitarian Technology's Imperative: Studies of Successful Field-Practice

Effective information technology design for any given work-system is based on an understanding of information practices that support its successful work.[1] However, naming the specific criteria of "successful" for humanitarian's core field-work remains elusive for academics and humanitarians alike (Renzaho, 2007). Even more mysterious are the particulars of the successful humanitarian field practitioners' information practices[2]—to include the information needs upon which the core field-work depends, and effective design of ICT requires (Fiori, Espada, Field, & Dickers, 2016; Clemens, Kenny, & Moss, 2007) .

Humanitarian agencies range from NGOs on the ground delivering aid to affected communities, to UN agencies filling coordination roles, to foreign governments providing resources and funding, to legal non-profits fighting for the enforcement of human rights and humanitarian principles. Humanitarian field-work represents the core implementation operations of humanitarian organizations.[3] It takes place where vulnerable communities affected by humanitarian crisis geographically reside (Hilhorst, The Real World of NGOs: Discourses, Diversity and Development, 2003). This field-work exists as part of an intersection of multiple complex, distributed, and adaptive social systems where objectives and outcomes vary widely

[1] Work—Using Jeil Schmidt's ethnomethodological view of "*ordinary work and in particular specialized domains of skilled activity, typically occupational practices defined by mastery of sophisticated technicalities*." (Schmidt, 2000)
[2] Practice – the work as it interacts with the everyday world and greater environment
[3] Humanitarian organization—non-governmental or international organizations that work directly with those affected by large-scale disaster and conflict around the world to reduce human suffering IAW humanitarian principles. (Lindenberg & Bryant, 2001; Hilhorst, 2003; ICRC, 2004)

among diverse missions that seek to uphold the humanitarian imperative.[4] What constitutes success for humanitarian organizations remains hotly debated among stakeholders (Renzaho, 2007; Humanitarian Accountability Partnership (HAP), 2010). Humanitarian success is without an equivalent to the universal metric of a discrete dollar-related "bottom-line" —a measure of success shared across all for-profit organizations. Rather, achieving humanitarian objectives is predicated more upon the dynamic ability to accommodate the ever-changing needs of vulnerable persons in alignment with humanitarian and human rights laws—and this in a multitude of ways, rather than on any specific outcome (Hilhorst, 2003). Given these distinctions, we simply have not adequately deciphered what is meant by mission "success" for effectively guiding the supporting design of humanitarian information technology. Humanitarian agencies and technology creators struggle to produce effective information technology for humanitarian work-systems, in-part, because we have yet to clearly discern and describe the information practices of successful humanitarian field-work.

This lack of clarity about successful field-work, and the information that supports successful outcomes, continues to hamper the effectiveness of information technology interventions for the humanitarian work-system. The boom of ICT at the turn of the 21st century brought countless new actors from the for-profit domain. Despite a number of committed humanitarian-technologist partnerships among the world's most reputable agencies in the international humanitarian domain and technology development (such as ICT4D, IDEO and

[4] The obligation to relieve suffering and the right of the suffering to receive relief; and encompasses the values of *humanity, impartiality, neutrality*, and in particular, *independence (ICRC, 2004)*

NetHope)[5], interventions still consistently fail to produce results commiserate with their investments (Toyama, 2015). While failures to adopt humanitarian technology solutions include technology's general lack of ability to accommodate "what **we know** we must support socially" (i.e. the socio-technical gap[6]; Ackerman, 2000, p. 179), it is also includes a great deal of **not actually knowing** "what we must support socially" for the humanitarian work-system. For example, the vast majority of humanitarian information system (HIS) efforts are aimed toward optimizing headquarters[7] information tasks where technology is part of the day-to-day work setting and where workers and the work they do are more accessible to study (e.g. Sahana's open source mapping software, OpenDatakit (ODK) for reporting of data to account for funding of programs to donors; and Humanitarian Logistics System (HLS) or Helios for tracking supply and logistics movements).[8] The scarcity of technology innovations serving field-work is matched by a deep deficit in rigorous analysis of successful field-work, the information that sustains success, and the practice of how *that* information is accessed and applied.

When field practitioners' needs go unmet, the entire humanitarian mission is compromised. Therefore, it should be no surprise that humanitarian ICT (HICT), repeatedly fails

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[5] ICT for Development (ICT4D) is a community of researchers aimed at bridging the digital divide between wealthy and poor nations.

IDEO (not an acronym) is an international design company specializing in design methods for product design.

NetHope is a consortium of technology companies and humanitarian organizations, started by Microsoft, that seek to create technology solutions for humanitarian and development work.

[6] Socio-technical gap - the shortfall in technology design's ability to support known social phenomena (Ackerman, 2000)

[7] By headquarters I am referring to the supporting components of a humanitarian organizations outside of the geographically based site of humanitarian intervention, providing services such as administration, fundraising, quality control and technical or logistical support.

[8] Sahana- free and open-source software for disaster and emergency management (sahanafoundation.org)

OpenDataKit - free & open-source set of tools to help organizations author, field, & manage mobile data collection (opendatakit.org)

Helios - open-source based software for humanitarian supply chains (http://www.fritzinstitute.org/prgTech-HELIOS_Overview.htm)

when technology creators are forced to operate in the "shadows" regarding successful on-the-ground practices (Klein, 2009). Absent a grounding of humanitarian field practices, technology remains disconnected from the "real" work of humanitarian agencies (Baxter & Sommerville, 2011). Technology designers addressing the sociotechnical gap between HICT and the collaborative work it intends to support will continue to mis-aim their solutions towards unsubstantiated ideas about how work is conducted. Such well-intentioned, but mis-directed, technological "solutions" not only surreptitiously and precipitously risk burdening the broader humanitarian work-system with ineffectual tasks—but also the eventual deterioration of the overall mission (Sandvik, Jumbert, Karlsrud, & Kaufmann, 2014; Jacobsen, 2015). While technology optimists may speak fluently of the benefits technology will provide and has provided humanitarians (Meier, 2011; Tatham & Christopher, 2018; NetHope (CEO), 2018), without mechanisms for assessing a holistic, situated perspective of impact on the actual field practices, and the humanitarian values that shape them, such claims remain hollow (Read, Taithe, & Mac Ginty, 2016).

This dissertation seeks to address the need for a more perspicuous understanding of holistic and situated humanitarian information needs by shining a light on the nature of successful information field practices. With such understanding, the aim of more effective humanitarian ICT design might be achieved.

B. My Approach

This research reveals the hidden practices within the humanitarian field-work of RedCross/RedCrescent (RCRC) practitioners to inform more effective design for humanitarian ICT. It asks the question: **What are the relevant information needs of field-level practitioners**

for successful outcomes, and how do they access and apply that information? My research uniquely:

+ **Characterizes essential information via a theory of practice.** The design of ICT, and in particular information systems, follows a highly detailed and exacting science according to the known roles of information within practice[9] (Ackerman, 2000). However, Suchman establishes that important elements that create success in the outcomes of the work can be 'hidden' from collective organizational awareness with key success factors existing behind the curtain of direct observation (Making Work Visible, 1995). This insight is especially true in geographically distributed humanitarian field-work where there exists heavy reliance upon implicit expertise, trusted relationships, social networks, personal communication, and unwritten work practices (Walton, Mays, & Haselkorn, 2016; Hilhorst, The Real World of NGOs: Discourses, Diversity and Development, 2003). Effective design requires a highly intimate understanding of the role of information not just within the context of structured work, but within the context of the work interacting with the world through everyday practices (Feldman & Orlikowski, 2011).
+ **Takes a grounded view of "success."** For effective design of ICT, information needs must be known within the context of successful work practices. Automating work-system's information needs introduces a devastating risk of standardizing poor and ineffective methods that can constrain practices that lead to successful outcomes. To

[9] Ibid #2

address a dearth of consensus among humanitarian agencies for "success," I point my analysis toward the everyday work practices of practitioners named by their peers as doing "good" work or, for some, the "best" work in their field. In so doing, I follow the example of early domain organizational scientists who recognized those doing the work as the best judges for pointing us to the best work.[10]

+ **Approaches humanitarian ICT design from a human-centered perspective,** and therefore, does not start with a niche solution to be fit into the humanitarian context. This research, drawing from Bruno Latour, recognizes that ICT design and development can carry hidden "black-box[11]" assumptions of "ready-made-science" about the general nature of people's information practices (Science in Action, 1987). However, technology cannot be isolated. It exists as an intervention within a system of pre-existing systems (e.g, cultural, environmental, ontological, political). Because humanitarian work-practices can be contradistinctive to the values, cultures and goals of more well-known and established types of work, design for humanitarian technology requires a human-centered, holistic approach (Kling & Star, 1998).

+ **Uses the successful practices of RCRC field practitioners as a baseline for broader humanitarian practice.** The RCRC Movement was formed in Geneva in 1863 to train noncombatant volunteers to care for the wounded in battle (Cavendish, 2013). Since then, humanitarian assistance has expanded to disaster and peacetime needs and numerous other agencies now participate alongside RCRC in the establishment, advocacy and a

[10] Grounded Theory - Constructed from the data themselves (hence "grounded" in the data) (Charmaz, 2014)
[11] "Black-Boxes" is a term used to refer to paradigms encoded into technology that is invisible (Latour, 1987). See II.C.3.

commitment to human rights and humanitarian laws in the care of vulnerable populations suffering from devastating crisis. As such, these not-for-profit agencies, both non-governmental (NGOs) and international (IOs) collectively operate under guiding principles of the humanitarian imperative[12] and humanitarian values described in the International Confederation of the Red Cross (ICRC) Code of Conduct (ICRC, 2004). RCRC, as the founders of this code, provide a baseline for practice—and success—other agencies may consider for conducting humanitarian field-work in accordance with these stated humanitarian values.

C. Major Takeaways

I describe grounded research conducted with humanitarian field practitioners of the International Red Cross/Red Crescent Movement (RCRC) who have been named by their peers as doing "good" work across a wide variety of geographies and projects**.** I distill from their stories of success and failure, and of the information that matters, a theory of information practices for successful outcomes within humanitarian resilience[13] work. This theory is depicted as a **Wheel of Successful Practice** (WSP, full figure and description page 90, Fig.12). Because it identifies critical elements across cultures, geographies and programs, the wheel presents a needed framework for humanitarian organizations and technology designers for more effectively designing ICT to support humanitarians, broadly.

[12] Ibid #4

[13] Humanitarian agencies tend to organize work around a preparedness component and a response component, although these are highly interrelated. The importance and impact of these values and practices in disaster *preparedness* can be seen more readily when the work transitions into the *response* component (which is supported by preparedness work). Resilience is an evolution of these work components that blurs the lines between response and preparedness and identifies community empowerment as core capacity (Mays, Walton, & Savino, 2013).

1) First, the Wheel of Successful Practice (WSP) contributes **a grounded theory of information practice that supports successful humanitarian field-work** as a baseline applicable across countries, contexts or sectors. Success is expressed as the culmination of four progressively realized Must Have's (MHs): (1) community trust, (2) community organization, (3) community agency, and (4) long-term impact. The wheel details the "what" and the "how" of practitioners' most important information practices to achieve these MHs. It depicts 11 critical, Success Factors (SFs: the "what") and 30 Information-Driven Behaviors (IDBs: the "how") enacted across contexts and conditions by successful field-practitioners or their organization to bring forward the expression of the most critically needed information to create successful outcomes. Practitioners' shared information needs for success rested in information revealed via social agency. The shared view of success is characterized as whether communities[14] "take" up ownership of —and hence, behaviors toward—increased, long-term resilience. Success is progressively realized via a work-practice process and social interaction embedded within community discourse and community-practitioner interaction.

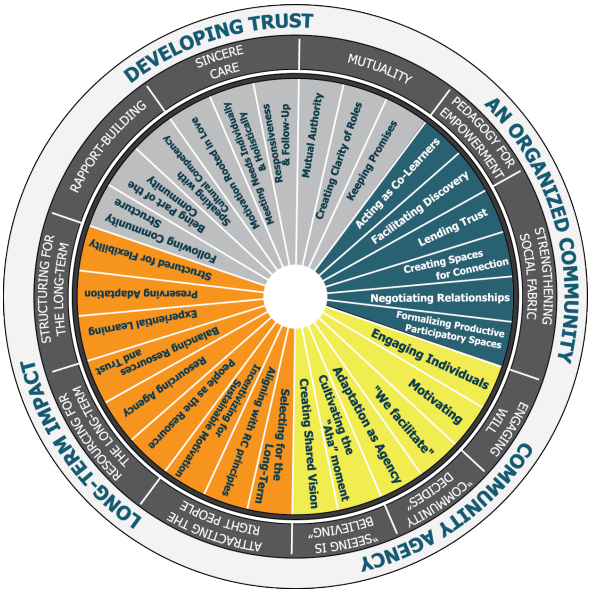

Fig. 1. Small-scale depiction of WSP (See full size at p. 90)

[14] Community - In this paper am referring to the geographically local populations who may or may be disparate parties that identify together—e.g. be families, local NGOs, local governments, workers, or rival gangs. Throughout the paper, however, I may also use the term more generally to refer to other groupings of disparate stakeholders: e.g. humanitarian community = various humanitarian professionals and organizations.

2) Second, the Wheel of Successful Practice offers **a shift for the parameters of humanitarian "information"** for consideration in humanitarian ICT design. In reframing information in terms of social discourse and interaction, it creates pathways for narrowing socio-technical gaps within humanitarian technology design and development. Specifically, the research reveals **the most critical "information" needed for successful humanitarian outcomes is the implicit and shared knowledge of communities personally and relationally expressed within trusted spaces for the use by the community, for the community, according to the community.**

   This reframing:

   - Reflects information as adaptive social processes in lieu of data descriptions and data relationships.
   - Targets information owned and expressed by outside communities for community action and decision-making, rather than controlled by the organization for organizational action and decision-making.

3) Third, the Wheel of Successful Practice presents **a model for assessing technology's alignment with humanitarian accountability** for which humanitarian organizations—and the ICT designers to whom they entrust their efforts—are responsible. While technology design is held accountable for whether it functions in compliance with technological adequacy, there is a need to bring accountability measures for technology design's impact on humanitarian field-practices and the broader humanitarian mission (Sandvik, Jumbert, Karlsrud, & Kaufmann, 2014; Read, Taithe, & Mac Ginty, 2016). The wheel presents behaviors within a humanitarian work-system to serve as a subject of diagnosis for

technology's impact (or unintended consequences) on humanitarian effectiveness. Such a model represents a significant start for creating tools and pathways to bring information technology into account for impacts on humanitarian outcomes, both positive and negative.

In addition, insomuch as elements identified within RCRC successful field-practice also uniquely reflect practices for facilitating social discourse and agency, the WSP offers the following four broader theoretical contributions. These hold implications for organizational theory and human-centered design for social-agency centered systems. In particular, the findings raise future implications for new lines of research and methodological ambitions for socio-technical systems (STS) scientists.

1) For humanitarian organizations and socio-technical theorists, the WSP **exposes elements in traditional organizational designs that can conflict with the greater humanitarian mission, and a need to <u>shift design</u> to core work-practices at the field-level.** Where, for example, decision-making for humanitarian action and community programming flows from the bottom (community)-up versus top (headquarters)–down. (Full size of systems contradistinctions depicted here, see p. 190, Fig. 19). The findings suggest agencies like RCRC (and the academic research that supports them) could benefit from assessing more closely for structural incompatibilities with meeting the information needs for successful humanitarian outcomes.

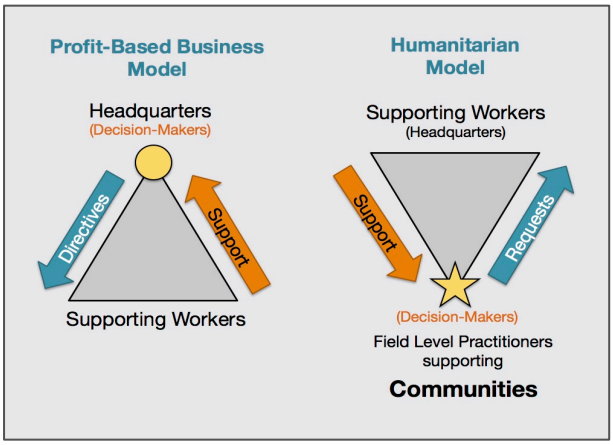

Fig. 2. Small-scale depiction of contradistinctions in organizational design

The WSP's deeper revelations about successful field practices create opportunities for exploring and innovating with more compatible structures for better supporting organizations' core work, e.g. exploring ways for increasing organizational alignment with bottom-up, organically developed, or democratic characteristics.

2) **The WSP challenges the notion that current task-based information models are transferrable/ generalizable to non-profit or socially negotiated work-systems.** This paper exposes where technology design and development approaches come ensconced with "ready-made-science"[15] assumptions regarding the generalizability of certain information structures, of how information is valued and of the practices surrounding it. Assessing misalignments at the intersection of the Information-Driven Behaviors (identified in this study) with central ICT development and design methods can illuminate where established ways of creating technology that we have long considered as generalizable across work-systems, may in fact, not be.

3) My research **highlights broader approaches of Human-Centered Design (HCD), where HCD is the design of socio-technical[16] systems for enhancing people-driven work**. For the "human-centered design" and accountability of Social Agency, human-centered parameters established by Kling and Starr (1998) must be re-claimed. In so doing,

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[15] Bruno Latour's metaphor for science methods that already have socially negotiated agreements about accepted "truths" (1987, p4)

[16] Sociotechnical refers to the interrelatedness of *social* and *technical* aspects of an organization or the society as a whole (Cooper & Foster, 1971). Socio-technical systems are the interaction of the social aspects of people and society and technical aspects of organizational structure and processes working together.

researchers are finding methodological pathways for accommodating diverse social requirements of varying work-systems. While legacy design strategies for impacting behavior find themselves isolated from both socially and technologically holistic iteration,[17] burgeoning HCD work echoing conceptualizations presented by Kling and Star's seminal work on Human-Centered Systems, is achieving both. With Kling and Star's basic principles as the foundation, this work goes beyond whether the technology functionally works for a user, but also of whether it works for a broader social system or social mission.

4) This theory **provides a specific case study for developing sociomaterial methods to advance Social Agency-Centered ICT Design.** Modeling social agency as information via the WSP, makes technological routes and gaps in designing for participatory social agency more apparent. It promotes a human-centered model for going further: innovating sociomaterial methods for participatory design and development of technology that empowers dynamic distributed knowledge and social agency. As such, the WSP's detailed mapping of social interaction as an information practice offers a tangible example for innovating socio-material solutions for holistic and hyper-participatory design and development malleable enough to accommodate social dynamics. Such that, it could allow more nuanced dissections of the challenges for creating both socio and material accountability for bridging more contextual social requirements, such as needed for the humanitarian socio-technical gap.

[17] e.g. User-Centered Design

D. Organization

This dissertation is presented in six chapters. Following this introductory chapter (1), I present (2) background and related works, (3) methodology, (4) findings, (5) discussion, and (6) a brief conclusion.

In the first two sections of Chapter 2, I present published peer-reviewed and gray literature relevant to understanding humanitarian values, field-work, humanitarian effectiveness and hidden work. In the middle two sections, I review the background of early foundations of ICT4D and Humanitarian Logistics efforts within humanitarian ICT design, the influences and challenges embedded within these efforts, and emerging relevant socio-technical systems research innovating design approaches of human-centered systems. I close this chapter by summarizing this conceptual background which exposes the socio-technical gap in humanitarian technology, and supports my argument for the need for grounded studies of successful humanitarian field-practice to close the gap.

Chapter 3 conveys my research assumptions and the methodology describing the grounded qualitative methodology employed for analyzing data and validating the findings. Chapter 4 presents the findings conveyed as a theory of successful humanitarian field-practices via the Wheel of Successful Practice (WSP). This theory frames the practices requisite for accessing information central to achieving success in humanitarian field-work. The data is presented according to the four major "success" themes identified as "Must-Haves" (MHs). Under each Must-Have section (i.e. Trust, Organized, Agency and Long-Term Impact), I define and describe the applicable Success Factors (SFs), using quotes and examples from the data, to

illustrate how the Information-Driven Behaviors (IDBs) are enacted to meet the information needs for successful humanitarian outcomes.

In Chapter 5, I discuss the limitations of this study followed by a discussion of how this work shifts our understanding of humanitarian information. I highlight key design implications for humanitarian ICT (HICT), our notions about human-centered design (HCD), and broader socio-technical theory (STS). A concluding summary in Chapter 6 provides takeaways and points towards future work.

II. Background and Related Work

My theoretical framework draws from five main theoretical bodies: understandings of hidden work (Suchman, 1995); the social construction of scientific assumptions (Latour, Science in Action, 1987); the divide between social systems and technology design (Chambers, 1997; Ackerman, 2000; Bertalanffy, 1968); technology design for human-centered systems (Kling & Star, 1998) and sociomateriality (Orlikowski, 2007). The work of Chambers provides a foundation for understanding the importance of lowest level empowerment in achieving the humanitarian imperative. Theories of Suchman, Orlikowski and Latour provide a foundation for challenging technological assumptions about "success" and "effectiveness" of work, and the need for effective design to be informed most importantly by work in practice. Ackerman's framing of the socio-technical gap and Bertalanffy's General Systems Theory (GST) offer helpful language for articulating the problem space between successful design and humanitarian practice. Kling and Star's dissection of the design of human-centered systems provides guideposts for emerging methods in ICT human-centered design for bridging the humanitarian socio-technical gap.

Academia has long-partnered with humanitarian agencies along disciplinary tracks such as law, economics, health, and agriculture to advance methods and innovations in their work ranging from engineering to evaluation. There are a handful of respected, focused academic programs that provide central curricula of global principles in international aid and humanitarian relief, program management and evaluation as a future career path (e.g. Harvard Kennedy School, Tuft's Fletcher School, Colombia's School of International & Public Affairs, London School of Economics to name a few leading schools). Apart from these dedicated programs,

research and study of humanitarian and development work have been classified as sub-specialties within the confines of the major disciplinary fields. These specialties align closely with the sectoral veins by which humanitarians generally classify and organize their programming[18] (The Sphere Project, 2011). Academics, thus, tend to hold to disciplinary boundaries in their contributions. For example, improved technical interventions for new or low-cost vaccinations to the world's infectious diseases can be found published within the public health research; harvesting breakthroughs in drought prone regions via agricultural sciences; and water and sanitation solutions to turbid waters via civil engineering contributions.

However, the training and development of specialized humanitarian methods for field operations (ranging from disaster risk reduction and response operations to IT and security operations) is not led via these traditional academic pathways to careers (Good Practice Review, 2018). Rather, humanitarian agencies, themselves, bear the principle burden of defining, organizing, developing, and advancing humanitarian principles and the best field operation practices (Voorhies, 1990; Walton, Mays, & Haselkorn, 2016; Humanitarian Practice Network (HPN), 2018). Organizations and agencies of the practice community–that is, those who are implementing humanitarian assistance on the ground—lead in the studying, learning, advocating, innovating, and iterating of their operations. As such, they are recognized as the presumed authority for defining and understanding the work (Lindenberg & Bryant, 2001; Chambers, Who's reality counts? Putting the first last, 1997; Walker, 2005). Yet, while they provide some of the most rigorous and valid research on humanitarian field-work and its innovations (e.g. Sphere,

[18] Programming represents the central operations of implementing agencies. Although varied according to organizational missions, there is a shared structure and ontology across humanitarian actors that centers on "sectors" (e.g. water and sanitation, health, or child protection) and is largely reflected via the SPHERE standards (The Sphere Project, 2011)

field operations guides, monitoring and evaluation guides, or assessment toolkits), much of this knowledge is classified as "gray" literature—i.e. practice-based documents lacking academic peer-reviews and scholarly credentials—and therefore, is not as easily accessed (nor as easily interpreted) within academic circles.

The turn of the 21st century, however, has seen a parallel exponential growth in technology, disaster frequency, and increasing global vulnerability, and growth of economic resources for humanitarian aid work ***(Carroll & Neu, 2009; Whiting & Ayala-Ostrom, 2009; Vinck, 2013)*** creating increased incentives-–and pressures—for incorporating more technological capacity within humanitarian field-practice. ***(Russell, 2005; Whiting & Ayala-Ostrom, 2009)***. This has attracted new academic disciplines such as supply chain management (SCM) and ICT, previously more oriented toward organizational needs within the commerce and military arenas to expand their research into the humanitarian relief and development aid space (e.g. ICT for Development (ICT4D), humanitarian logistics, Harvard Humanitarian Initiative (HHI)).

Given my aims to build upon and merge both practice and academic knowledge for identifying the information needs and practices of successful field-work, I also review relevant literature and studies from across these spheres of influence including international development curricula, operational gray literature, and relevant fields in academia such as humanitarian logistics and Information and Communication Technology for Development (ICT4D). I start with literature close to organizational practice and the humanitarian context for viewing the nature of hidden work and information, generally, and within the humanitarian work-system (section A), and contradistinctions of "success" and "effectiveness" within the humanitarian

work-system compared to commerce work-systems (section B). I further critically examine the early efforts and influences of HICT, as well as ongoing challenges to identify and address the humanitarian socio-technical gap (sections C). Finally, I revisit Kling & Starr's designing for Human-Centered Systems (HCS) for more compatible principles for humanitarian ICT design (section E) and summarize the imperative for grounded studies of humanitarian field practices, of which this study undertakes (section E).

A. Humanitarian Field-Work: Hidden Work and Hidden Information

Humanitarian field-work exists as part of a complex, adaptive, work-system[19] operating under undefined, distributed and dynamic conditions (Celik & Corbacioglu, 2010; Chambers, 1997; Voorhies, 1990). Critical information can be hidden from explicit knowing, not only because it exists geographically distributed from the larger organization, but also because it is (1) dynamic and ephemeral under the constant strain of change and uncertain environments; and (2) often carried in the unwritten and experiential learning of experts (Walton, Mays, & Haselkorn, 2016; Walton, Mays, & Haselkorn, 2013; Maiers, Reynolds, & Haselkorn, 2005; Voorhies, 1990).

1. Uncertainty of Humanitarian Information

A key attribute of humanitarian field-work is that of working in a dynamic and uncertain environment. Like fish in a sea of water, field practitioners navigate within a sea of rapidly changing information and unpredictable circumstances (Carroll & Neu, 2009). This starts with

[19] work-system - used broadly and interchangeably with socio-technical system (ibid #16) to include the processes and activities, participants, information, and technologies within the context of the work's customers, environment, infrastructure, product/services and strategies. (Alter, 2013)

their dynamic end goal to meet the constantly changing and evolving needs of populations experiencing everything from armed conflict, to health epidemics, to infrastructure destruction (Benini, Conley, Dittemore, & Waksman., 2006; Long & Wood, 1995; Oloruntoba & Gray, 2006; Whiting & Ayala-Ostrom, 2009). Humanitarian practitioners are seeking to meet population needs via undetermined resources and constrained logistical pathways (Benini, Conley, Dittemore, & Waksman., 2006; Long & Wood, 1995; Oloruntoba & Gray, 2006; Whiting & Ayala-Ostrom, 2009; Voorhies, 1990), and among stakeholders, power structures and processes which emerge and evolve with each event (The Sphere Project, 2011; Voorhies, 1990). Situationally specific and dynamically developing ways of operating in difficult to reach locations results in rapidly changing information and much mis-information (Celik & Corbacioglu, 2010; Maiers, Reynolds, & Haselkorn, 2005). Not only is the accuracy of information perishable, it is also embedded with culturally and contextually specific meanings. The wide array of diverse languages, perspectives and motivations of local and foreign networks and authorities heightens the risk for misunderstandings and misinformation (Walton R. , 2011).

The way in which these forms of uncertainty exist as part of the norm in the humanitarian work-system contrasts with other types of work that experience uncertainty much more as intrusions on a fairly predictable workflow ((McLachlin, Larson, & Khan, 2009; Kovács & Spens, 2007). Therefore, information technology that evolves from other types of work can miss the mark as to what is effective, efficient, and valued for humanitarian information systems. Chambers observes:

"*In normal bureaucracy, central authorities simplify, control and standardize. In normal, top-down, centre–outwards development, new technology is developed in central places by uppers*

and transferred to peripheral lowers. The resulting 'Model-T' standard [technology] packages often misfit diverse and unpredictable local conditions." (Chambers, 1997)

Chambers illuminates a core conflict that exists between current approaches to technology design and an ability to accommodate the uncertainty of humanitarian field practices. Wherein commerce systems may aim to isolate or control unpredictability within markets and outcomes (Skipper & Hanna, 2009), humanitarian field-work aims to accommodate the diverse and unpredictable needs and locations of their recipients (Walton, Mays, & Haselkorn, 2013). ICT designers might inherently assume, for example, that "normal" operations means that electricity is available except in rare circumstances. Yet, in humanitarian and development settings normal operations often includes unreliable or non-existent power and communication networks that must be accounted for within the core design.

Lean logistics expert, Dr. Hugh McManus, points out that even in complex business systems, mature techniques exist for some classes of uncertainty, but poorly defined terminologies prohibit a wider understanding (McManus & Hastings, 2004). Illustrating this problem, the literature uses a wide variety of well-defined terms and strategies related to the types of uncertainty planned for in commerce models (e.g., volatility, disruptions, risks, unexpected deviations.) But none of these terms capture the core nature of the type of uncertainty humanitarians navigate—that is, where disruptions are part of the expected day-to-day operation (Walton, Mays, & Haselkorn, 2013). For the design of humanitarian ICT, the hidden norms of greater uncertainty require more nuanced understandings of information needs and practices as they manifest within the real-world environment in which humanitarian field-work subsists.

2. The Invisibility of Implicit Expertise

Existing research underscores the value of implicit work. Suchman's work draws attention to "*in the case of many forms of service work, we recognize that the better the work is done, the less visible it is to those who benefit from it*" (1995, p. 58). In his book, Streetlights and Shadows: Searching for the Keys to Adaptive Decision-Making, Gary Klein debunks common assumptions of **bias** as "bad" or as negatively skewing the quality of information. He provides a rich, rigorous body of data testifying to the critical value of implicit bias as seen the case of experts (Klein, 2009). Klein provides context to the value of knowledge work and experiential learning beyond what is readily observable to academia and wider public audiences. He tunes us into the "shadows," where important work is conducted, but is not easily seen nor explained, particularly within emergency and predictive environments. For example, he observes from many years of study with firemen, that experienced firemen "don't decide—they act." Long years of entering fires results in implicit knowledge so that actions they take routinely may not even be recognized as a decision. For example, when one fireman told his crew to get out just before a floor gave out—he couldn't say why he did, nor did he feel that he explicitly decided. The fireman testifies that he just acted. Klein contends that although his 20 years of experience developed instinctive knowing that recognized a need to act, his consciousness did not see this as a decision. Klein draws attention to this hidden knowledge to emphasize **where ICT systems "*are designed by people who are insensitive to tacit knowledge, their devices and strategies are likely to interfere with expertise rather than support it*"** (p. 124) These examples show where meeting the highest standards of work can often depend on highly implicit skillsets, even hidden unto the practitioner, themselves. Examples of this are especially found in professions with deep

field-work (e.g. rescue work, military) and in rapidly changing or uncertain information environments (e.g. weather, intelligence, health)—all similar to humanitarian contexts.

Field-work and the information that drives it can be hidden not only because it is geographically distributed in difficult-to-access locations, but also because the contextual nature of field-work relies heavily on autonomy and implicit expertise (Voorhies, 1990). Case studies of emergency field-work in general, as well as of humanitarian field-work, show that critical information for decision-making is often buried in the qualitative noise of culture and context, and depends heavily upon an experiential understanding (Walton, Mays, & Haselkorn, 2016; Benini & Conley, 2007; Voorhies, 1990). These studies testify that disaster response agencies will intentionally afford greater autonomy to decision-makers on the ground because they hold the most up-to-date knowledge of the immediate disaster conditions and/or project status (Walton, Mays, & Haselkorn, 2016)). They also have the closest relationships with local communities, the deepest insight into the needs of communities, and for navigating cultural sensitivities, political and governmental constraints (Chambers, 1997). Much of the work lends itself to a form of learning, and a development of expertise that are not easily observed.

Articulation Work

Kling and Star refer to the often subjective, and implicit "*efforts to bring together diverse materials*" or resolve problems in work as articulation work (Kling & Star, 1998). Left unexamined, the work of articulation is often assumed to be "*unskilled*" work that can be easily automated or outsourced (Suchman, 1995, p. 59). However, both Klein and Suchman emphasize that when mechanized human work replaces the knowledge and experiential learning required to develop higher levels of implicit knowing, there are costly unintended consequences to the

quality of the work (Klein, 2009; Suchman, 1995). Their studies stress the importance of more intimate approaches in design where, particularly in the case of humanitarian field-work as the organization relies on an expert's ability to operate in diverse cultural contexts with disparate stakeholder groups, overlooking articulation work in ICT design could prove devastating to people's lives.

While humanitarian organizations are prolific at developing information tools and programs related to technical programming, their research and resources are primarily focused on understanding and optimizing the process of meeting population needs and raising funds (Balcik, Beamon, Krejci, Muramatsu, & Ramirez, 2009; Maiers, Reynolds, & Haselkorn, 2005; Voorhies, 1990). Very few of these organizational studies investigate the operations and information needs of field articulation work (Lindenberg & Bryant, 2001; Fiori, Espada, Field, & Dickers, 2016). Yet, priding themselves as "learning" organizations,[20] humanitarians fervently pilot and push outside innovations from for-profit industry and academia—and can be found feverishly "reorging[21]" every few years—even as these different organizational models repeatedly fail to achieve their intended benefit (Edwards, 1997; Lindenberg & Bryant, 2001). As long as innovative solutions and academic studies remain distant from a deeper understanding of humanitarian field practices, the changes they promote continue to create conflicts and obstacles between policy and field implementation (Chambers, 1997; Voorhies, 1990).

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[20] The "learning" approach is a staple in the development and social learning literature (Korten, 1980) that recognizes change in society happens most sustainably via bottom-up learning (Rogers, 1962). This evolved into "organizational learning" a management practice to be applied to the organization and promoted by popular non-profit writers like (Senge, 1992-2010) and (Drucker, 2009) as an organization continually adapting to be what the management/customers/workers need it to be, which can tend to manifest itself as frequent reorganizing (or reorgs) (Edwards, 1997, Lindenberg & Bryant, 2001)

[21] reorganizing

3. Studying Hidden Work

Given the inaccessibility of humanitarian field-work with its geographically distributed, ephemeral and implicit nature, it is not surprising that academic research into humanitarian field-work for information systems tends to take an outside-looking-in view. Unable to fully immerse in the core field-work across communities, researchers depend upon case studies and things that can be seen and accessed via technology, in reporting, or higher headquarters efforts—e.g. interagency cooperation, logistics movements, or social media activity (Balcik, Beamon, Krejci, Muramatsu, & Ramirez, 2009; Meier, 2011). Reaching deeper understandings within the research calls for greater involvement of those within the culture.

In her efforts for "*making work visible*" (1995), Suchman calls for a more reflexive engagement to those who wish to apply their design skills within hidden work arenas. Suchman stipulates that there exist differing, "*even conflicting*", perspectives, meanings and "*ways of knowing*" within a work-system (p. 61). Agents not explicitly aware of these differing meanings, face the risk of creating errors in "representations" of the work. She substantiates that these representations driving "solutions" for more effective work, are intimately tied to both (1) the researcher's or designer's own assumptions, and (2) the chosen stakeholders views designers/researchers recognize in their perspectives of how effective work is accomplished. Rather than representing the work they intended to serve, there is a high risk of re-creating the work to, instead, serve (and shift power to) the interests of unverified, yet consequential, perspectives (Chambers, Who's reality counts? Putting the first last, 1997; Freire, 1970). I extend Suchman's premise with a notion that these representations are also tied to assumptions embedded within researchers' technical design and development **methods.**

Within the scope of effective ICT design, organizational science researchers providing insights for uncovering the nature of hidden work (Suchman, 1995; Orlikowski, 2007), rely on interpretivist forms of inquiry, and tend to be social constructivists who "view knowing and learning as embedded in social life." (Charmaz, 2014) Charmaz reminds us that when work is yet to be named and measured, knowledge of its value begins with grounding discovery in those doing the work. Devers (1999) points out that a positivist approach is not helpful when subjective meaning and value are relevant to what we want to know because it ignores the influence of context –its inquiry, by definition, is "objective" and "value-free." In fact, positivist approaches that assign objective meaning had to at one point rely on interpretivist studies before constructing so-called "objective" quantitative measures of efficiency within work processes (Latour, Science in Action, 1987).

Lincoln and Guba further present that a stronger assessment of the validity in qualitative research is to review the elements of credibility and dependability; transferability rather than generalizability; confirmability vs objectivity; and add the unique criteria of authenticity (Lincoln & Guba, 1986). Further, in consideration of cross-cultural contexts such as are characteristic of humanitarian efforts, and work settings with their own ontologies—greater dependability can be achieved via a joint emic-etic or insider-outsider approach to reveal shared cultural meanings that may not be perceived outside of personal experience (Aneas & Sandin, 2009). It's not surprising that this can be found among much of the literature revealing in-depth insights on humanitarian field practices (e.g., (Walker, 2005; Benini, Conley, Dittemore, & Waksman., 2006; Long & Wood, 1995; Oloruntoba & Gray, 2006; Voorhies, 1990; Hilhorst, 2003; Lindenberg & Bryant, 2001; Chambers, 1997) Revealing deeper meanings and realities

within humanitarian field-work drives a need for more practitioner-researcher collaborative work and insider epistemology (i.e. making meaning that is informed by a deep insider perspective) within study. These works are richer sources for bringing a sharper clarity of "success" and "effectiveness" within the humanitarian context.

B. "Success" and "Effectiveness" within the Humanitarian Context

"Humanitarian" work grew out of Henry Dunant's[22] work with victims of war, and the corresponding creation of the Geneva Convention, and—in its purest legal form—remains tied to situations of war and conflict (Geiß, Zimmerman, & Haumer, 2017). However, the work has expanded to include efforts to reduce suffering and economic destruction in impoverished communities affected by disease, drought, disasters, and other hardships. Humanitarian agencies prioritize serving the most vulnerable populations[23] where host nation government infrastructure and resources are not adequate to meet life-sustaining needs (ICRC, 2004).

Thus what constitutes "success" within humanitarian work, broadly, is not clear, nor uniform. Success generally can be defined as "the accomplishment of an aim or purpose" (Oxford English Dictionary, 2018). However, the particulars of the "aims" or what constitutes "accomplishment" can be as subjective and varied as the many perspectives and missions at play.

Policies promoting commerce-based views of measuring successful outcomes have become a donor trend (e.g. "results-based" and "evidence-based" programming). Actual "measures" of accountability by donors tend to be tied to the limitations of the funding cycle and

[22] The founder of the RCRC movement.

[23] In this professional community, while RCRC operates in western nations as well, humanitarian response tends to refer to the area of work advocating and working to support vulnerable populations of non-western, more resource-constrained populations and nations (disaster response is the more common ontology of response communities in developed nations).

how the money was spent—often based on more easily observable (and more easily counted) data points within constrained timelines. However, field-based studies and operational "gray" literature detailing the work and values of humanitarian "effectiveness[24]"—or the way humanitarians achieve success—is characterized more by the conversation of **impact** on communities and their well-being. I demonstrate below how this latter viewpoint can be quite contrary to popular donor perspectives and often, common personal assumptions of "effective" in systems design. Clear contradistinctions in system objectives and values relevant to IS design become quite apparent via a deep dive into the ontology of logistics information systems (IS) versus logistics of humanitarian operations.

1. "Success" and the Humanitarian Mission

To provide a starting point for understanding humanitarian "success;" humanitarian organizations are beholden to various international and national legal frameworks that reflect what they aim to achieve, and their values and constraints for doing so. In U.S. law, large humanitarian NGOs have explicit legal obligation to the "mission" of the organization (Lane, 2015; American Bar Association, 2013). In this case, I am not referring to a general use of the term humanitarian[25]. I am referring to organizations who are specifically beholden to international humanitarian laws[26] (ICRC, 2004). Humanitarian organizations aim to uphold

[24] Where success means to achieve an aim or purpose, effectiveness refers to the degree to which success is achieved (Oxford English Dictionary, 2018)

[25] Humanitarian in general terms means to be concerned with or seeking to promote the human welfare of others (Oxford English Dictionary, 2018)

[26] e.g. International Humanitarian Law (IHL) and The Geneva Convention (International Committee of the Red Cross (ICRC), 1949), The Declaration of Human Rights (UN General Assembly, 10 Dec 1948), the International Covenant on Civil and Political Rights (ICCPR; UN General Assembly, 1966) and International Covenant on Economic, Social and Cultural Rights (ICESR; UN General Assembly, 1966)

human rights, make provisions for these rights, and hold themselves and other institutions accountable to these rights (Humanitarian Accountability Partnership (HAP), 2010; ICRC, 2004; Walker, 2005). Organizations working in humanitarian contexts are operationally bound to the humanitarian imperative, which is the obligation to relieve suffering and the right of the suffering to receive relief; and encompasses the values of **humanity, impartiality, neutrality,** and in particular, **independence** (The Sphere Project, 2011; ICRC, 2004; Walker, 2005). As such, success within the humanitarian mission is, first and foremost, based on an ability to accommodate the needs of vulnerable persons in alignment with humanitarian and human rights laws.

The RCRC Code of Conduct

Non-governmental humanitarian agencies (NGHAs), whom are the implementers of international humanitarian relief to affected communities, have made these obligations transparent through mission statements, charters and by becoming signatories to the Code of Conduct for the International Red Cross and Red Crescent Movement (RCRC) and Non-Governmental Organizations (NGOs) in Disaster Relief[27] (Fig 1, ICRC Code of Conduct, 2004). This moral code of behavior lists agreed upon values of humanitarian work. Although signing the ICRC code of conduct is voluntary, non-signatories struggle to attain legitimacy within this self-policed community (Walker, 2005). The ICRC code of conduct defines

[27] This professional code was first developed by eight of the world's largest disaster response agencies and does not apply to solely the RCRC. There are 621 signatories as of Jan2017.

Principles of Conduct for the International Red Cross and Red Crescent Movement and NGOs in Disaster Response Programmes

1. The humanitarian imperative comes first.
2. Aid is given regardless of the race, creed or nationality of the recipients and without adverse distinction of any kind. Aid priorities are calculated on the basis of need alone.
3. Aid will not be used to further a particular political or religious standpoint.
4. We shall endeavour not to act as instruments of government foreign policy.
5. We shall respect culture and custom.
6. We shall attempt to build disaster response on local capacities.
7. Ways shall be found to involve programme beneficiaries in the management of relief aid.
8. Relief aid must strive to reduce future vulnerabilities to disaster as well as meeting basic needs.
9. We hold ourselves accountable to both those we seek to assist and those from whom we accept resources.
10. In our information, publicity and advertizing activities, we shall recognize disaster victims as dignified human beings, not hopeless objects.

Fig. 3. ICRC Code of Conduct (ICRC, 2004)

boundaries for the motivations and ways in which aid is offered. More relevant to a humanitarian mission-based view of success is not a definition according to outcomes, but rather, process (Walker, 2005; Hilhorst, 2003). With the success of humanitarian work-systems more constrained to adhere to a process that honors humanitarian values, rather than adhering to a specific end product, they require our deeper reflection for how we think about, design, and account for effectiveness.

2. Contradistinctions in Effectiveness: The Example of Logistics[28]

Designing for "effectiveness" within humanitarian information systems (HIS) based on the unique values of humanitarian missions remains poorly understood and understudied. This makes sense when we consider the hidden nature of aspects of humanitarian field-work (e.g.

[28] This section is a revised excerpt from my previously published work (Mays, Racadio, & Gugerty, 2012)

uncertain and dynamic information, implicit expertise; See Section II.A). When designers are forced to work in the shadows regarding understandings of effectiveness, they often turn to individual implicit understandings to field the void (Klein, 2009; Latour, Science in Action, 1987; Orlikowski, 2007). Yet researchers have shown, the distinct legal foundations of the humanitarian mission, cited above, translate to very different system values and objectives (e.g. maintaining a code of conduct rather than maintaining profit), organizational structures (e.g. flat hierarchies or bottom-up decision-making authority), and restrictions (e.g. constrained more by the means than the ends in organizational practice) (Chambers, 1997; Walton, Mays, & Haselkorn, 2013; Sen, 2000).

One clear area of misalignment with what "effective" means can be seen in design of IS for humanitarian logistics. While there is no standard definition for logistics, logisticians across multiple contexts predominantly agree on the quip that logistics is "getting the right things to the right place at the right time" (World Logistics, 2012; Defense Logistics Agency, 2012). Despite the fact that humanitarian logistics may share this same general definition for logistics—and share similar tools (e.g. trains, planes and automobiles)—they do not share the same central aims and values, nor constraints. Humanitarian organizations operate within a highly unpredictable and rapidly changing environment (versus highly controlled networks and predictable demand) (Balcik, Beamon, Krejci, Muramatsu, & Ramirez, 2009; Tomasini & van Wassenhove, 2009; Carroll & Neu, 2009); value the means of the work as much or more than the ends (Sen, 2000); and seek to save lives rather than maximize revenue or profits (Stevens, 2008; Lindenberg & Bryant, 2001). Yet, the research is dominated by for-profit logistics companies and academic efforts who have predominantly attempted to "improve" humanitarian logistics systems by

applying commerce system values of what makes "effective" logistics through transfer of their ISs (Kovács & Spens, 2007). Matured under western-capitalist culture and domain, and through decades of design advancement via commerce innovation, these systems are highly evolved in the science of managing cost optimization, reducing uncertainty, predicting demand, and creating long-term presence (Jackson & Bianco, 2011; Schlefer, 2012). While IS designers have consistently thrust these commerce-based perspectives, methods and technologies into the humanitarian context, none have yet to be sustainably adopted and integrated into humanitarian practice (Blecken & Hellingrath, 2008).

Following, I illustrate possible reasons for these failures may be rooted in the encoded meanings of key terms such as 'demand,' 'sustainability' and 'optimization." I offer that commerce and market motivations infuse meanings contradistinctive to the operational needs and values that these terms hold when applied to a humanitarian work-system.

a) Effectiveness Contradistinction #1: Market Demand versus Need

Commerce-based logistics models are designed around the market concepts of supply and

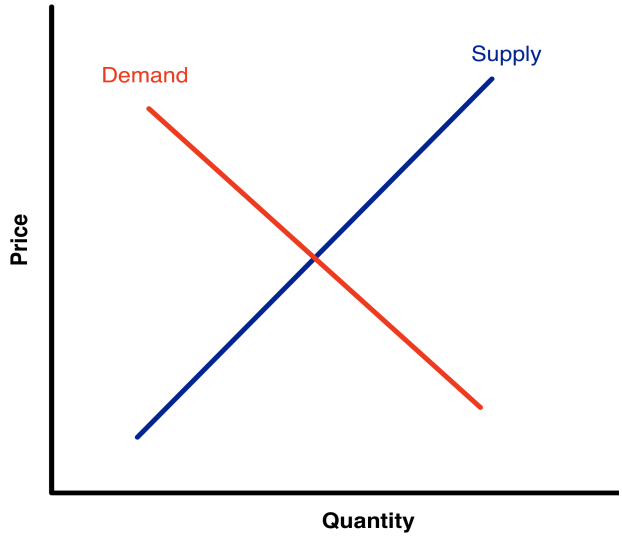

Fig. 4. Supply and Demand

demand (Fig. 2). This principle, for example, explains that the quantity of a good supplied together with the level of market demand will determine an equilibrium price and quantity at which the market will clear. Two key assumptions underlying this model are 1) perfect information and 2) perfect competition. Neither of these assumptions hold in the humanitarian context.

Perfect information refers to the idea that decision-makers (producers and consumers) have full information on product price, characteristics and substitutes. While no market fully lives up to these expectations, disaster situations by nature are much worse—plagued with incomplete, rapidly changing, conflicting and missing information (Maiers, Reynolds, & Haselkorn, 2005; Walle & Turoff, 2008). Perfect competition implies that markets consist of large numbers of buyers and sellers such that no player can affect the price of a product. In disaster situations, suppliers may be very few in number, and 'consumers' may have few choices in terms of providers since substitutes are few. Moreover, the beneficiaries of disaster assistance are not analogous to consumers, who (in theory) can exercise choice and choose an alternative supplier if the price and quality of a particular product are not appealing. Many goods provided by humanitarian relief agencies are not discretionary. When *necessity* removes choice from the supply and demand equation, people must pay whatever is asked for their survival.

An extreme example of this occurred during the 2004 crisis in Darfur. Sudan villagers were being driven by force from their homes by rebel forces and gathering in large camps near urban areas. While humanitarian agencies were doing the best they could to deliver provisions of food

aid, families collected firewood wherever it could be found to prepare the rations for eating. Jingaweed[29] soldiers who roamed the area would shoot and kill any men and rape any women they encountered. Because men were killed, women were forced to take the risk of rape in order to feed their families. (Mercy Corps (Cassandra Nelson), 2004; Fritz, 2004) In such situations of life threatening *need*, even when the cost was as unappealing and incomprehensible as rape, it had to be paid in order to survive.

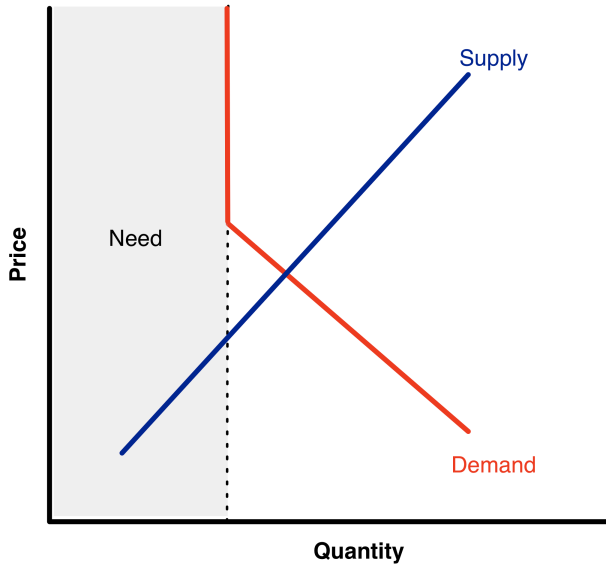

Fig. 5. There is a minimum threshhold (or "need") that humanitarian agencies are constrained to meet.

Goods required to live beyond destitution, such as food, water, and shelter have a minimum requirement that is greater than zero (Fig. 3). Any amount below this minimum requirement threatens people's ability to sustain life. Thus, in humanitarian logistics work there

[29] An armed faction of the Sudanese govt systematically raiding villages, killing, raping, and driving people from their homes. (Wood, Dying in Darfur: Can the ethnic cleansing in Sudan be stopped? 2004)

is no true market and no real discretionary demand—instead, there is unequivocal *necessity* (i.e. need).

In a competitive market, price is determined by available supply and demand and the market clearing price maximizes consumer and producer utility (Market equilibrium price is the point where the supply and demand curves cross – Fig. 2). But where supply is limited and consumers have no ability to pay, market clearance is unlikely to take place in a way that honors social welfare. Competition to drive down prices is unavailable, making it unlikely that need (or demand") could be justly accommodated through a market mechanism.

Humanitarians aim to deliver goods and services to those in need in the most appropriate way and as quickly as possible—cost is not the primary driver. The market cannot function in the constraints of this environment, where supply is almost always limited. Goods need to meet standards agreed to by the agencies, and for some of these goods the number of producers is very limited, with limited capacity" (Tomasini & van Wassenhove, 2009). Here, the cost-minimizing motivation behind supply-and-demand models doesn't stand. Consequently, humanitarian agencies are constrained to meet a minimum threshold, and hence forced to pay whatever the cost is in order to meet the need. Thus, the perspective of humanitarian logistics that puts the humanitarian imperative first, requires a model of supply-and-*need* to be considered for humanitarian disaster relief.

b) Effectiveness Contradistinction #2: Sustainability

The long-standing goal of a for-profit business, and a key metric of its success, is its ability to *sustain a market* and thus its operations over time. This can be accomplished by beating out competitors, adapting and keeping pace with the changing demand of the market, or

by generating new demand and creating markets which had not previously existed. Thus, it aims to *create and maintain a market* for its product or service. In this way, business success is defined in terms of business survival (Heikkilä, 2002; Praag, 2003).

Alternatively, humanitarian success is not to sustain their own service or existence, but for their beneficiaries to become able to *sustain themselves* again. The success of humanitarian operations is weighed in their ability to help move a community out of crisis mode and back to normalcy as quickly as possible (Lindenberg & Bryant, 2001). Thus, unlike economic systems, humanitarians seek to create and maintain independence separate from their product or service (Chambers, 1997).

Humanitarian logisticians operate with a strategic obsolescence to their service—building on local capacity to aid in long-term sustainability for the community, but otherwise constantly appearing and disappearing wherever most helpful for meeting the constantly changing needs and operational context. While focused on long–term impacts, services are relatively short-term. Hence, humanitarian supply chains are intended to be temporal.

These differing views translate to vastly different supply chain models. In the business case, we desire a long-standing, reliable supply chain focused on outcomes, sustainable logistics are centered on cost minimization and predictability of outcome. These models include overarching control of the supply chain as an essential and basic element of their design (Gunasekarana, Patelb, & McGaughey, 2004). However, for humanitarian operations owning and controlling the supply chain is contrary to the humanitarian goals of returning communities to self-sustainment and introduces additional limits and constraints not optimal for humanitarian effectiveness.

A good example of the fleeting value of controlling the supply chain for humanitarian work is the 2002 humanitarian food aid deliveries made to famine areas in Zambia:

"*Logistically, everything seemed to be in place. The ports, trains, and roads were assessed and reinforced; agreements with suppliers were negotiated and signed; transportation and warehousing were all coordinated, and the amounts of aid per region were allocated. However, the crisis took a significant turn as the aid began to arrive. The maize was found to be genetically modified, and in the eyes of Zambian authorities this was unacceptable. Zambian President Levy Mwanawasa voiced his opinion to the international community saying, "Just because our people are hungry it doesn't mean we will feed them poison*." *All distribution of maize was temporarily suspended, and WFP had to find an alternative solution to conduct their lifesaving mandate. The rejected maize had to be collected, and in some cases milled for redistribution. New sources of maize had to be identified and coordinated, sometimes at a premium price.*" (Tomasini & van Wassenhove, 2009).

In this example, where there was complete control of the supply chain, it did not offer a greater guarantee of efficiency of delivery nor of cost. This example demonstrates that not only can attempting to control the supply chain be incredibly expensive for humanitarians without providing an intended sustainable logistics solution for the community—but to do so does not necessarily provide greater security of meeting an end goal delivery. Further, while for-profit businesses may enjoy considerable freedom in choosing the markets they serve to avoid such supply chain risk, following the humanitarian imperative requires delivering goods in highly risky and unpredictable environments. In short, the underlying drivers and constraints of market-

based systems and their sustainability manifest a supply chain that is not a sustainable solution for humanitarian aims.

c) Effectiveness Contradistinction #3: Optimization

A third mismatched term is optimization. Optimization under a market-driven model includes the above assumption of long-term control as part of sustainability. Specifically, commerce logistics optimize around costs. Where the aim of a commercial organization is: "Make money now and in the future," measurements are given by throughput accounting as: throughput, investment, and operating expenses (Frechette, 2010). This does not mean that business models do not value other elements such as speed, meeting the customers need, or flexibility; however, it does mean they optimize around those factors specifically to the extent that they better serve the bottom-line. For example, time or distance may be a key measure because the longer it takes something to get from manufacturing to delivery equates to increased costs in transportation, inventory or a customer's willingness to pay more or less (Heikkilä, 2002). In this case, multiple ways of moving the goods can be more costly and least optimal. As Econ 101 instructs: *"resource productivity reduces costs through process efficiency, including supply chain optimization"* (Frechette, 2010). The system aims to narrow all options to find the most efficient—or the one that meets the demand at the least cost possible.

While companies do not have direct control of demand, they put a great deal of time and effort into assessing and predicting demand of their product. This is true, because uncertainty is expensive. Where uncertainty can be avoided, the system aims to do so in order to meet the primary constraints of the bottom-line. A highly controlled supply chain in a long-term, top-down, organization yields greater flexibility at the lowest cost by reducing the company's

operational dependencies (Heikkilä, 2002). Therefore, when designing supply chains in this context (whether by vertical integration or by contract) optimization favors highly controlled supply chain models. In other words, controlling the supply chain = controlling uncertainty = controlling costs.

However, where commerce models strive to eliminate uncertainty, humanitarians must operate within it. In unpredictable environments, a single controlled solution is not optimal. For humanitarians, where uncertainty cannot be avoided, logisticians require a greater range of flexibility for how delivery can be achieved. Previous co-authored research I conducted observes that options are a key tool used by humanitarian logisticians to meet needs most efficiently (Walton, Mays, & Haselkorn, 2013). We found that neither cost nor speed alone is central to decision making in disasters insomuch as they allow the logistician to meet needs "as fast as possible" and as appropriate as possible. Further, Smith and Dowell in their disaster response case study observed teams actively pursue a number of options in parallel. They call this approach the "progression of multiple options" and identified it as the team's *optimized* way of operating (A case study of co- ordinative decision-making in disaster management, 2000). In order to meet and respond to unpredictable changes, the system must be designed to accommodate far greater ranges of uncertainty. Rather than be limited to a single cost-optimized route, humanitarian logisticians simultaneously pursue multiple options to meet as yet unknown needs, not foreclosing on any option unless absolutely necessary. In stark contrast to market-driven models, what makes for an effective humanitarian logistics system is the ability to manage uncertainty, by optimizing for options and flexibility in the way items are delivered. In

other words, humanitarians are more *effective* in meeting the ever-changing situations of their environments when they have more options versus a single solution.

Because humanitarian logistics systems are called to prioritize the humanitarian imperative above cost optimization and support locally driven efforts for the most successful operation, market-driven systems are unreliable to meet the mission. What is "effective" in humanitarian operations, therefore, drives the need for the recalculation of supporting system designs according to different parameters.

3. Measures for Humanitarian Effectiveness

The stronger push by donors and market-oriented "new actors" (aka. For-profit businesses) has led to a greater emphasis on standardized information reporting and big data—i.e. data centered around things that are repetitive and predominantly quantitative (Renzaho, 2007; Imas & Rist, 2009). This is problematic because while the for-profit work-system's primary indicator of success (profit) and top-down style of direction aligns well with quantitative measures, they are not easily developed for conveying meaning within a highly contextual, multi-variable domain as we see in humanitarian field-work (Chambers, 1997; Lindenberg & Bryant, 2001; Ebrahim, 2003). The humanitarian system's legal obligations to a mission defined by a moral code of conduct have a stronger reliance on qualitative criterion for accounting for effectiveness (Sen, 2000). Market-based measures of accountability, in fact, distinctly hold themselves neutral from normative claims of society, leaving the morally good or bad of the system as "personal preferences subject to a bargaining process between *individuals*'" (MacIntyre, 1984). Philosopher Alasdair MacIntyre points out that 'effectiveness' within the culture of economics, where it is measured by quantitative standards, is based in utilitarianism—

achieving the ends without a measure for the means. Such task-based systems are necessarily constrained to a *specific* outcome—e.g. for "getting the job done" and "the bottom-line" (ends)--or else their effort would not have "utility" (Horvath, 1995). Chambers called attention to this incompatibility 20 years ago observing that quantitative measures better serve what he called "bureaucratic" values (ie. top-down control) and tracing them to "errors" in international development work-- (1997, p. Chpt4).

Monitoring and Evaluation of programs or "M&E" is a donor-devised way for accounting for successful programs that perpetuates these "errors" in development. M &E is the accepted standard for humanitarian agencies to communicate the progress of their field-work to donors[30] predominantly as limited duration prescribed projects (Lindenberg & Bryant, 2001; Dept for International Development of the UK, 2002; Voorhies, 1990; Hilhorst, 2003). With M&E as the shared ontology for measuring programming (i.e. operational) effectiveness of field-work, various models exist often tailored according to sector or funding agent requirements (Voorhies, 1990; Hilhorst, 2003). Targets are primarily created according to theories of change and budget, and reporting is aligned with donor funding vehicles to report project activities, milestones and spending. M&E tends to share a general process of design-monitor-learn-adjust and follow a common core format of the "logframe" (Logical Framework, Fig 4) for reporting progress.

[30] There are also strategic aims agreed upon by the broader community of stakeholders together, which also involve setting aims and goals across actors, commitments from governments towards meeting them, and reporting their joint progress in reducing poverty and addressing crisis. These include initiatives ranging from the broader Millenium Development Goals (MDGs) and Sustainable Development Goals (SDGs) to more specific sectoral or practice focii such as the Hyogo Framework for Disaster Reduction (ISDR, 2007) or the Humanitarian Accountability Partnership (The 2010 HAP Standard in Accountability and Quality Management, 2010).

The logframe, in particular, when adopted by USAID in the 70s, filled a gap for a shared standard across agencies for reporting, and it was a leading commerce business practice adopted from NASA at that time. Although a "standard," its flexible format allows for it to capture qualitative reporting and be adapted to the multiple types of missions, programs and contexts found in aid work (European Union Integration Office, 2011). As the quip goes "*Not everything that can be counted counts, and not everything that counts can be counted.*"[31] As such, quality of participation, ownership and dialogue are difficult to communicate in numbers.

However, the logframe has been under fire. There has been a heavy push over the past couple decades by private corporations and donors to transfer more evolved commerce measures of effectiveness into the humanitarian domain. Of these, not least of which, are calls from donors for adoption of more market-based (aka "results-based") and quantitative views to include random control trials and a rejection of more qualitative approaches (Easterly, 2008; Imas & Rist, 2009). Yet, what can be controlled and quantified (via RCT, for example) does not necessarily contribute to assessing the effectiveness of humanitarian core-work. Lincoln and Guba observed quantitative data contributes "no significant difference" in the resulting determination if we only looked at what we can count and control for meaning (1986)—all the less helpful would an inconsistent meaning of numbers be when collected across cultures and situations.

[31] Unknown, accredited to Einstein

Log frame matrix of the Department for Internatioal Development of the United Kingdom

Project structures	Indicators of achievement	Means of verification	Important risks and assumptions
Goal			
What are the wider objectives which the activity will help achieve? Longer-term programme impact	What are the quantitative measures or qualitative judgements whether these broad objectives have been achieved?	What sources of information exist or can be provided to allow the goal to be measured?	What external factors are necessary to sustain the objectives in the long run?
Purpose			
What are the intended immediate effects of the programme or project? What are the benefits, to whom? What improvements or changes will the programme or project bring about? The essential motivation for undertaking the programme or project	What are the quantitative measures or qualitative judgements by which achievement of the purpose can be judged?	What sources of information exist or can be provided to allow the achievement of the purpose to be measured?	What external factors are necessary if the purpose is to contribute to the achievement of the goal?
Outputs			
What outputs (deliverables) are to be produced in order to achieve the purpose?	What kind and quality of outputs and by when will they be produced?	What are the sources of information to verify the achievement of the outputs?	What are the factors not in the control of the project which are liable to restrict the outputs achieving the purpose?
Activities			
What activities must be achieved to accomplish the outputs?	What kind and quality of activities and by when will they be produced?	What are the sources of information to verify the achievement of the activities?	What factors will restrict the activities from creating the outputs?

Source: Department for International Development of the United Kingdom, *Tools for Development: a handbook for those involved in development activity* (2002):

www.dfid.gov.uk/pubs/files/toolsfordevelopment.pdf

Fig. 6. Typical Logframe

Simultaneously, this move to transfer for-profit learnings has occurred even as implementers piled up operational lessons learned and guiding materials advocating for greater community engagement and participation. A focus on quantitative market-defined measures of effectiveness contradicts what field-practice has shown as less effectual for assessing highly relational (human) and process-oriented value, and for communicating situated meaning (of actions, words, or the numbers themselves) across highly diverse cultural and technological contexts (Renzaho, 2007; Hilhorst, 2003; Voorhies, 1990; Lindenberg & Bryant, 2001). Thus, there are also countless reports of the overwhelming limitations of donor reporting structures, and of the ubiquitousness with which execution of these methods conflict with humanitarian values and prove to be poor indicators of actual impact (Renzaho, 2007; Hilhorst, 2003; Voorhies, 1990; Lindenberg & Bryant, 2001).

As a leading advocate of "results-based" approaches, the Gates Foundation played a leading role among the donor community in insisting on methods aligned with this approach. In 2012, teaching a UW course on program evaluation in developing countries (that the author attended), the Gates Foundation Director of Strategy, Management and Evaluation displayed the zealous opposition often seen to qualitative methods in this thought-community. In her words, the logframe was a "shitty" tool and further presented participatory methods as "nothing more than feel good," (Nelson, 2012). Not to pick on Ms. Nelson, for it is (critically) prevalent for the powerful funders to demand accountability in the aid sector, while overlooking an equal level of accountability[32] for the actual impacts to, and self-determination rights of, vulnerable

[32] ICRC Code of Conduct #9: "We hold ourselves accountable to both those we seek to assist and those from whom we accept resources." (ICRC, 2004)

communities (ODI, 2016). While donors continue to strongarm NGOs leaders to report in these ineffectual ways, the work suffers. System effectiveness according to the market-based, utility-centered construct, is distinctly amoral (MacIntyre, 1984) or purposefully existing without assessment of its standing as *morally* 'good' or 'bad'. Within a framework of effectiveness devoid of the ability to gauge its alignment to social norms, is also not easily constrained by them. As such, while this may be inconsequential for economic success, such measures do not create accountability for the aims and obligations of humanitarian systems.

These contradistinctive characteristics of humanitarian work-systems when compared to commerce-based systems and measures leave scholars and practitioners wrestling with questions of **technology's** value in such unpredictable, varied, and hidden contexts. A tendency for technology designs to intrinsically assume humanitarian practice's alignment of effectiveness and success with better known types of work envelopes an absence of more explicit understandings for how the humanitarian mission manifests in field-work. Designers embed false work-systems assumptions about what is "effective" as part of humanitarian technology "solutions." In part, this persists because grounded studies are difficult and messy, especially within the humanitarian context. However, the constant repurposing of incompatible tech designs serves as a distraction for both the humanitarian and academic communities working to understand and address the real challenges to the advancement of overall humanitarian effectiveness.

C. The Humanitarian Socio-technical Gap: Efforts, Influences, Challenges

In 2000, Ackerman coined the term "socio-technical gap" to describe "a fundamental mismatch" of the inability of computer science (CS) and technology to fully accommodate the social aspects of human activity. Specifically, there is a chasm that exists between "what **we know** we must support socially" (p. 179) and "what we can do technically." Human interaction and collaboration with all its nuance and highly contextual realities are largely beyond the reach of design and development methods (Ackerman, 2000). For humanitarians this gap exists not only where technology design and development methods are unable to accommodate what is technically needed, it also exists in the **"knowing"** of those "socio-" requirements specifically for humanitarian work-systems (Ackerman, 2000).

Ackerman's observation of a gap builds on an older, revolutionary recognition of a gap identified by Bertalanffy, a systems theorist from the 60's, who observed the monolithic view "systems science" as inadequate (1968). There was enough of a confluence of technology and social functions coming out of the industrial revolution and, in particular, the rise of industrial-military corporate business organization (p. 4) that spurred the writing of his General Systems Theory (1968). In the age of organizational emergence from which he reflects, there came to be greater acceptance of looking at the interactions between previously considered discrete parts and how they work together and influence the other. In his theory, he identified the need for new methods to study the "interactions" between these monolithic sciences. Human activity posed a complex problem for traditional science that did not have the ability to understand the relationships between multiple variables within a system. As these were having to be practically dealt with within production and manufacturing, he reflects on an intellectual movement from

linear thought to circular systems involving feedback loops. He shifted the paradigm that only physical attributes were "real" to acknowledging non-physical attributes (which are not easily observable through hard science) of culture, psychology, and therefore perspective and relationship also was "real." (p. xxi)

His theory presents three pillars—a useful approach to which I refer throughout the paper to help orient discussions around the "gap":

1) **systems science** – analytical/summative methods to look within a single isolated domain of science (e.g. the science of psychology, mathematics, or physics—separately distinguished).

2) **systems technology** – a system's non-human hardware and software.

3) **systems philosophy** – a system's ontologies, epistemologies and values.

Where a "system" previously was viewed as closed, controlled and mechanical, Bertalanffy introduced the idea of a holistic view on science, or a "scientific exploration of wholeness" observing the ever-overlapping interconnectedness between biology, mathematics and individual autonomy.

1. Identifying the Humanitarian Socio-technical Gap

In the same vein, humanitarian practitioners struggle to make the ends meet between organizational science, the values of societal change and empowerment, and the environments they reside. Lindenberg & Bryant's manifesto in their book, Going Global-Transforming Relief and Development NGOs, testifies to the litany of conflicts between organizational systems and operational needs (e.g. "overcoming perverse funding dynamics" p82) where these professionals

are struggling to make these incongruent pillars meet (2001). Sam Voorhies, a seasoned aid practitioner, in his case study of his NGO's agricultural program, extensively details a chasm—that is still a large problem today—between (1) the HQ bias for misleading project measures, and (2) the neglect of human participation, resulting in disconnects between policy and the "real contexts" where the work is conducted (1990). The lack of recognition for the immense value of human work—and the unique skillsets and time needed to do those tasks—is a common theme throughout technology studies (Toyama, 2015; Orlikowski, 2007; Feenberg, Critical Theory of Technology, 1991). Even in Bertalanffy's time the new approach in "systems engineering" and "cybernetics" design was to eliminate or replace the human element declared to be "the most unreliable component" of these systems (p10).

Leaders of NGOs are under great stress to advance technology and business models and lack the ability to articulate these gaps between organizational and technological models and their work-practice needs. The humanitarian world has been slow to understand itself and thus its differences from the traditional systems science found in business. Academia and technology designers have largely been in the dark about how humanitarian work **really** works. Beyond reasons innate within the humanitarian context already presented in this paper, this is all the truer in light of a lack of ability for the technological world to wholly accommodate a conversation about social values.

Academia's lack of empirical understanding of the "socio-" within humanitarian work-systems remains predominantly overlooked. Theories on hidden work (Suchman, 1995) and characteristics of what Kling and Star call Human-Centered Systems (1998), although 20 years ago, only recently achieved influence at a level that makes it possible to collectively talk about

social systems and systems design more broadly and holistically (e.g. the rise of the CSCW[33] community and socio-technical theory). Today, we are amidst a modern discovery of design's impact beyond "the hardware and software[34]" of a thing—finally bridging Bertalanffy's boundaries "systems technology" across "domains" within "systems science," (1968). Scientists are more ready to acknowledge and embrace the impact of designers on organizational and work systems, and even social or human systems (Toyama, 2015; Orlikowski, 2007). It has opened the academic forum to discuss more impactfully the yet-to-be-articulated specific complexities of the socio-technical gap within humanitarian work-systems to include: both (a) where technology fails to understand the practical realities of humanitarians work on the ground and (b) where technology design and development methods are unable to accommodate what is technically needed. The first of these I began to address in the previous section and will link more specifically in the next section to technology design. The lack of accountability of "(a)" leads us directly into a discussion of some specific limitations that can be viewed of "(b)."

2. Early HICT Efforts: ICT4D and Humanitarian Logistics

Over the past twenty years there has been a parallel in the exponential growth of disaster frequency and increasing global vulnerability, and of economic resources towards humanitarian aid work (Felbermayr & Groschl, 2014; DIIS, 2014) creating increased incentives—and pressures—to incorporate more technological capacity within humanitarian practice (Sandvik, Jumbert, Karlsrud, & Kaufmann, 2014). Around the turn of the millennium, corporate interests began to make headway into higher headquarters of humanitarian and development foreign aid

[33] Computer Supported Collaborative Work
[34] Bertalanffy's description of systems technology

agencies to leverage engagement into technology initiatives (Russell, 2005; Whiting & Ayala-Ostrom, 2009). Early "charitable" efforts such as the Fritz Humanitarian Logistics Institute[35] and NetHope[36] to "donate" technology expertise began with them partnering with field agencies to map business processes and develop "customized" technology solutions. The pressure increased for For-Profit partnerships (aka. Private-Public Partnerships) in the industry and on reluctant field-operators (i.e. traditional aid implementation agencies such as NGOs, UN, RCRC) to accommodate the escalating interest and criticism by these non-traditional actors who see technology as the answer to optimizing and scaling the reach of humanitarian assistance (Seck, 2007/8). This heightened involvement by corporate logistics and technology entities spurred an increased academic involvement.

ICT4D[37]

The Information and Communication Technology for Development (ICT4D) gained traction in the early 2000's as one of the earlier emergent technology-oriented communities devoted to the use of ICT in eliminating poverty and empowering poor and marginalized communities in developing countries. Born out of academic ICT disciplines aligned with commercial interests this community belies its roots. Even though ICT4D scholars (Unwin, 2009) have cautioned against a modernization perspective and against imposing development agendas that are biased toward a Western, democratic, capitalist and/or Christian ideal in communities with their own unique development goals, much of the literature focuses on

[35] One of the early commerce logistics initiatives that focused on creating humanitarian logistics technology
[36] ibid. #5
[37] Includes revised excerpts from a previous-authored published paper (Mays, Braxton, Berry, & Robinson, 2016)

imposing tools and technological capability where technological capabilities and increasing technological literacy are often introduced as neutral or positive (Schech, 2002).

ICT4D predominantly posits, and in some cases directly proposes, that the propagation of ICT into developing communities is desirable and that technology's "success" in these communities hinges on its diffusion (Schech, 2002; Altay & Pal, 2014). Embedded in this view, technological literacy is equated with the ability to use tools as designed. Access to technology is equated to use, which equals increased knowledge, which equals improved lives. A perspective that disadvantage stems from lack of knowledge and information; knowledge and information stems from a central point, usually the government, and that this knowledge is by definition beneficial and useful to recipients echoes "universalism" (Schech, 2002). It has pervaded the forward ambitions of technology design for decades—a way of framing "best" solutions as though seeking a single universal design for all (Touray, Salimnen, & Mursu, 2013).

These continuing ambitions are now prevalent in efforts to harness technology in service of humanitarian goals. Humanitarians have decidedly embraced the call to "take advantage" of the rapidly escalating technological advances from 3-D printing, to big data, to drones, that predominantly focus on data collection for higher HQ reporting and donor consumption (e.g. the popular OpenDataKit (ODK)[38]). While positive adoption for accomplishing the support functions of humanitarian field-work (i.e. fundraising, reporting, and marketing), the abundance of these efforts to bring new technologies is with very few examples of adoption and little evidence of positive impact toward increasing the effectiveness of field-work (Toyama, 2015).

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[38] Ibid #5

Humanitarian agencies have worked diligently, most recently, to embrace "innovation" and incorporate greater digital design and development into the humanitarian work-system, ushering in a recent salvo of creative efforts. Along with increasing numbers of universities dedicating departments and funding initiatives for humanitarian research and incentives for bringing technology to the humanitarian field (e.g. Harvard Humanitarian Initiative, the MIT and Stanford USAID Research Labs), the language of "innovation" and the integration of technology within the humanitarian sector has escalated. There are numerous examples of this trend. The RCRC dedicated its annual World Disasters Report for 2013—on the technology and the future of humanitarian action (Vinck, 2013). In 2014 Medicins san Frontiers (MSF a.k.a. Doctors Without Borders) began an annual scientific days to showcase its efforts in innovation and technology (MSF-UK, 2014), and in 2016 the World Humanitarian Summit, declared a focus to address future "innovation" challenges (ICVA, 2016). The past five to ten years have seen a burst of multidisciplinary, cross-sectoral communities, conferences and movements co-led by humanitarian agencies such as the World Conference on Humanitarian Studies (WCHS) and the Humanitarian Innovation Project (HIP). Overwhelmingly, even within long-standing aid agencies, there persists an association with technology which belies a modernization perspective (Vinck, 2013). Such top-down perspectives are problematic, hindering innovation at the lowest-levels. In turn, questions are being raised regarding power, privacy and profit (Sandvik, Jumbert, Karlsrud, & Kaufmann, 2014; Jacobsen, 2015). Increasingly alarms are being sounded for concerns around the rights violations of vulnerable persons, accountability shortfalls, and other ethical considerations of technology innovations (Read, Taithe, & Mac Ginty, 2016).

3. Humanitarian Technology: "Ready-made-science" vs "Science-in-the-Making"

Bruno Latour's 'black-box' theory contends that designs embedded in technology are built from meaning derived according to a particular constructed reality (or viewpoint), and then become universally accepted and forgotten over time (Latour, Science in Action, 1987). These meanings become opaque black boxes that are not easily opened. In other words, common technological solutions with flawed, surreptitious assumptions about 'all' work (although designed for a specific type of work system e.g. for-profit) often predispose unassessed designs as compatible for the humanitarian work-system, whether they are or not.

Latour's, Science in Action, describes how our understanding of much of what we accept as established truths within science, actually started as discoveries that had to be socially negotiated (Latour, Science in Action, 1987). He calls the beginning state "*science-in-the-making*" and the resulting state "*ready-made-science*." Discoveries that have become "ready-made" are no longer revisited as to how they came be, and are accepted for building upon for all future discoveries—e.g. the DNA helix structure, the computer chip.[39] In the case of ICT design, we have "ready-made" commerce systems that have, however surreptitiously, evolved to socially and academically accepted models upon which to build all future ICT systems. Efforts in humanitarian logistics technology represent a clear example of this (see II.B.2). Fueled by decades of academic advancement in commerce logistics, the commerce model for moving

[39] Latour describes the resulting blind and concretizing of assumptions into continuing science a black-box. A term he borrows from Cyberneticians who, whenever a piece of machinery or set of commands is too complex, and only needed to the input and output, they would instead draw a box.

goods and measuring 'effectiveness' has created a 'ready-made science' myth of what makes good logistics overall.[40]

In fact, Information Systems more generally provide a strong example for exposing "ready-made" assumptions in ICT design. Computer technology emerged out of military initiatives (Bertalanffy, 1968), and matured through the computerization of government, and an industrialization age dominated by an economic-oriented lens of order and value (Schlefer, 2012). A decidedly commerce biased view of systems followed systems thinking out of the industrial revolution and into the so-called age of information and information systems (IS). Technology design and development methods follow decades of iteration rooted in these types of work-value systems (Davis, 2000). IS pertains to engineering technology[41] that has been designed to support communication and decision-making via technology and excludes the idea that information systems exist in the social sciences (Davis, 2000). Common characteristics of traditional IS work-system values include: (1) closed/controlled system attributes with (2) top-down decision-making and (3) task-based functionality. In turn, without critical assessment of underlying values in design and development methods, academic research in pursuit of supporting technology solutions for humanitarian purposes also remains closely aligned with these specific value-perspectives (Blyler, 2004). Thus, the technology design of information systems remains locked in the 1960's version of the second component of systems science as "systems technology" (Bertalanffy, 1968). The definition of technology tends to remain rooted in

[40] Includes excerpts for previously published co-authored work (Coletti, Mays, & Widera, 2017)

[41] Using the term technology gets a little tricky here since "technology" today used jointly with "information" is in common-practice understood to mean computer and communication related radio and electronic technologies but in Bertlanffy's day was grounded in mechanistic and industrial designs of the day.

a paradigm of hardware and software that was designed by engineers for purposes that are grounded in for-profit business assumptions out of the industrial revolution.

Yet, humanitarian work is uniquely defined by human rights, humanitarian laws, and codes of conduct. It operates with bottom-up authority, open society participation and necessarily demands a support structure with commitment and priority to their values intentionally applied in every aspect of design. When technology and tools come embedded with assumptions, the objectives and constraints of humanitarian work cannot be reverse engineered. Chambers calls the dilemma of this phenomena, (documented by researchers including him, Voorhies (1990), and Orlikowski (1993)) "the transfer of reality," (chpt 4) and articulates it this way: "Often [the] receiving environments differ from those in which technologies have been developed, being more complex, more diverse, less controllable and more risk-prone. The technologies than cannot on any scale fit local conditions or human needs." (1997).

Project managers and practitioners on the ground in humanitarian response working with communities, or within preparedness of disasters (perhaps even more so), are a typical example of those who receive this application of black-boxing toward their behavior (Walton, Mays, & Haselkorn, 2016). From the onlooker perspective of a US citizen watching the Haiti earthquake unravel on the news or from a support role in an humanitarian organization HQ, actual on-the-ground implementation is not visible. Thus, we apply our assumptions according to what we personally have experienced (or "know") about "effective" work (Heraty, 2010).

In other words, embedded into the traditional design of organizational (or "normal bureaucracy") and the pursuit to "standardize" are objectives which stand in tension with the field-work required to effectively meet the overall mission objectives of improving the lives of

the poor (Chambers, 1997, pp. 63-66). As quoted earlier, Chambers describes it: "In normal bureaucracy, central authorities simplify, control and standardize. In normal, top-down, centre–outwards development new technology is developed in central places by uppers and transferred to peripheral lowers. The resulting 'Model-T' standard [technology] packages often misfit diverse and unpredictable local conditions" (1997, p. 56). The application of standard technology into the humanitarian context carries hidden barriers and obstacles to providing lowest level control, and to accommodating or adapting to the highly dynamic systems of social well-being and decision-making.

Given the historical roots of organizational and informational support systems design within traditional for-profit interests which implicitly import incongruent perspectives and assumptions of for-profit work, it makes sense that we have not seen more success (Blyler, 2004). There is little recognition of assumptions regarding effectiveness, incompatible ontologies, design-for-the-individual constraints, and over–regard for economic value that ties them to an addicted use of quantitative measures for evaluation of effectiveness.

Overlooking the specific embedded assumptions about the way work is ordered in common ICT design approaches is at the heart of stalled progress for developing sustainable solutions for the humanitarian context. Yet, I look next at what is even less acknowledged—the impact that these "transfer of realities" may have on practice.

4. Pinpointing a HICT '–Technical' Gap

Returning to Ackerman's definition of the socio-technical gap: the gap between "what we know we must socially accomplish" and the technological capacity to do so. In establishing a

need to first identify specifically the "socio-" requirements of humanitarian ICT, and in having done this through the research that follows, we are better positioned to consider HICT's **"–technical"** gap, i.e. where technology design and development methods are unable to accommodate what is technically needed for HICT. Context-aware socio-technical system communities, such as CSCW, have exposed the risks of adopting traditional methods for highly complex contexts (Baxter & Sommerville, 2011). Common ICT design methods such as User-Centered Design (UCD, and others such as object-oriented design) uphold specific work-system values such as top-down or non-transparent decision-making that are in direct contrast, particularly, to humanitarian field operations values such as self-determination.

Below, I review two key technical design methodological approaches that serve as barriers to accommodating the socio- for a socio-technical system: the requirements document and user-centered design (UCD). I close where, in HICT, UCD methods are billed as Human-Centered Design (HCD) while actually maintaining the limiting principles of usability.

a) The Requirements Document

There exists a dominant approach to technology design which defines and fulfills 'requirements' in a technical, mostly product-centered way (Yu and Mylopoulos 1994; Baxter and Sommerville 2011). The requirements document, born out of traditional engineering, is the shared practice of developers for ensuring that a product adheres to engineering standards—that is—that it works the way it was designed to work. As an ever-persistent accountability mechanism for ICT design, it presents in terms of technical functions and features often serves as the primary contractual agreement between the customer and a software designer for delivery of the technical specifications of a product.

The requirements document, however, does not assess how the design will meet the requirements of the larger work-system (nor does it intend to do so). Yet, there is an existing bias present through the interpretation of a social requirement into a technical specification, defined as technical codes, but which carry the values of the dominant technical actors (Feenberg 1991). This is not only problematic for the support of humanitarian work, especially when you consider the frequent aims of technology makers to replace human work—the consequences for the humanitarian mission are upon the well-being of people's lives.

b) User-Centered Design (UCD)

UCD and the ability to understand user experience (UX) is one of the hottest trends in technology today. Generally, the UCD process describes a way to address problems, and provide and test technological design solutions while keeping the pre-defined user's goals, practices, motivations and pain points in focus (Rubin & Chisnell, 2008). Yet, while it is promoted as a solution for humanitarian ICT,[42] it holds implicit barriers to addressing the socio-technical gap.

With one foot in the psychology and social behavior change literature and the other in technology design, the field of persuasive technology (PT) uniquely offers one of the most intentional approaches to designing digital applications to close the socio-technical gap (Lockton et al., 2008). PT is a controversial specialty due to methods that may be intentionally non-transparent to users about their intent to change behavior. However, because theorists in this field offer an attempt to bridge behavior change and technology via the design process it provides us a tangible view of underlying constraints that exist in bridging Bertallanfy's pillars in ICT design.

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[42] Often under the title of "human-centered design"—see section II.C.4.a

In Bertallanfy's view—a software application is the "systems technology" merging with and the "system domain" of psychology and that domain's "systems philosophy" or how to influence behavior. Importantly, while this body of work may provide strategies helpful for design once a specific behavior and mode of technology have been chosen, these strategies overall tend to a) support technical behavior (e.g. to get someone to click or stay online longer) to proxy as actual behavior and b) confine technology to predesignated behavioral aims.

B.J. Fogg's 8-step model (Fogg, 2009) provides a clear illustration of the implicit barriers that exist in most common design approaches ultimately underpinned by a UCD process (see Fig. 7). While Fogg is not representative of all UCD approaches, his theory allow us to observe deeper barriers between the developmental engineering of ICT and the top-level design and ultimately, to accommodating the "socio-" of socio-technical systems. As it is applied in Fogg's model, the design process iterates on the specific technology elements, but is not able to holistically iterate on the initial behavior. As the iteration of technology happens in two distinct iteration segments or cycles, such that Bertalanffy's pillars are still unable to be merged. While the first four steps of the process iterate on the primary problem behavior (that of defining the target behavior, audience, and barriers to address), at step #5 (selecting a persuasive technology example to imitate) iteration shifts from focusing on the behavior (systems philosophy) solution to the technical design. Iteration in the application design resides largely separate from development iterations, creating a stunted or split iteration primarily restricting the technology to the initial definition.[43] It is a recurring problem that some things that become "hardcoded" into a

[43] I am referring to a basic discover-define-design-develop iteration process that can be seen within variations of most design models.

design create barriers to iterative "discovery" after the "develop" step has passed (discover-define-design-develop model).

In a nutshell, UCD begins once the technology is known, confining it iterations only inside of Bertalanffy's "systems technology" pillar. As it is applied in Fogg's model, UCD is used to iterate on the specific technology elements, not the initial behavior. While it seeks to put a user's behavior at the center of application design decisions, this distinct division[44] prevents the ability to iterate on the target behavior itself, leaving a digital design only for the chosen behavior regardless of how varied or diverse the long-term behavioral objectives may be. This dissection highlights methodological detachments from the wider domains (Bertalanffy's 1st pillar) that are inhibiting the ability for design and development to bridge to the differing ontologies, epistemologies and values (Bertlanffy's 3rd pillar - "systems philosophy") within those domains.

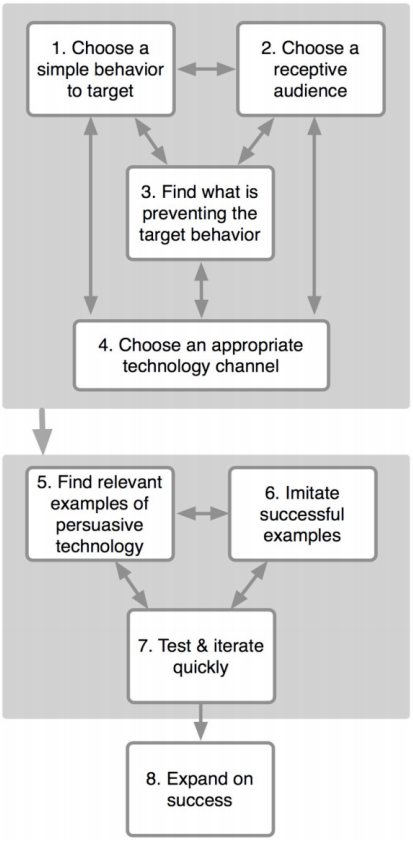

Fig. 7. Fogg's 8-Step Model for Designing for Behavior Change

c) HICT and Human-Centered Design (HCD) as Usability

For the first time in its history, USAID has begun partnering with universities (launched April 2014, (USAID, 2018). They have embraced HCD as an answer to bridging the digital

[44] Fogg acknowledges the entire process does not clearly allow for complete iteration across the solution.

divide between rich and poor nations, even going so far as quoting Everett Rogers "this is how diffusion of innovation happens" (Rogers, 1962) in calls for proposals requiring human-centered design and engineering (HCDE) to promote development in vulnerable communities (USAID, Call for Proposals, 2014). Unfortunately, as funded capacities have recognized and seek to bridge a gap in ICT design and approaching innovation, their call for "human-centered" has contributed to a confusing over/mis-use rendering little meaning in its popularity. "Human-centered" has been used to describe everything from usability, where it is used interchangeably with UCD to describe design for a specific technology to make it more easy to use for an individual's preferences or ways of doing things (International Organization for Standardization, 2010); to design prioritizing humanity and done with empathy (IDEO, 2018; Girling & Palaveeva, 2017); to the aforementioned principles for designing for human-centered systems (HCS, (Kling & Star, 1998).

Viewpoints on HCD, by both the widely accepted ISO engineering standard and the popular, IDEO, faithfully echo HCD as usability as seen in user-centered design (UCD). Usability is explicitly about someone "using" technology (Rubin & Chisnell, 2008)—i.e. in Bertalanffy's framing, it an improvement of "the hardware and software of a thing" as it attempts to include individuals' "philosophy"—and sits squarely inside the boundaries of GST's second pillar of systems technology. This prevailing popular view of HCD is that the human in "human-centered" design refers to designing a specific technology to make it more easy to use for an individual's preferences or ways of doing things.

The International Organization for Standardization (ISO) defines the human-centered aspect as "An approach to systems design and development that aims to make interactive

systems more usable by focusing on the use of the system and applying human factors/ergonomics and usability knowledge and techniques" (ISO 9241-210:2010). The ISO explicitly notes that the only difference between the term "human" and "user" centered is that human-centered expands the group of stakeholders as "users," and in fact uses the terms "synonymously" throughout the standard.

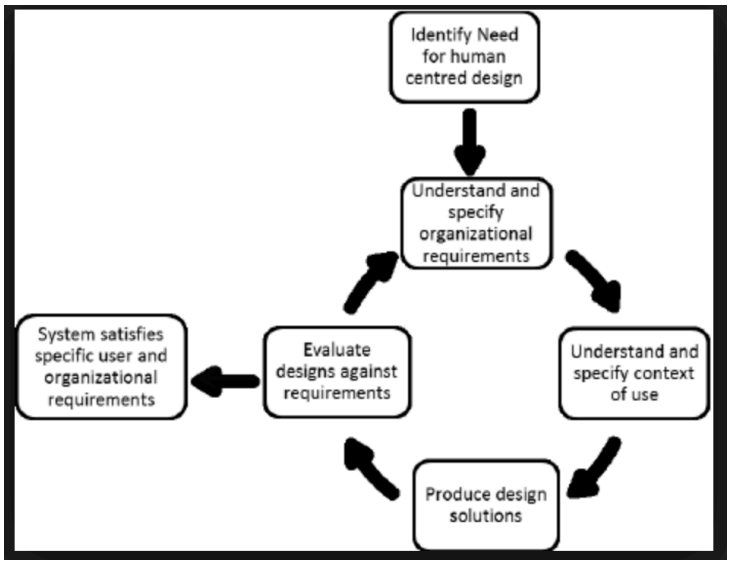

Fig. 8. ISO 9241 HCD Process

The ISO standard presents a design process that focuses on an upfront design for end-product solutions, and sets evaluation against the engineering "user" "requirements" (Illustrated in Fig 8).

IDEO is a design thinking company promoting an extremely popular design thinking method following the ISO school of thought (IDEO, 2018). It is more of a modernized hip version with essentially all the same ingredients, but a reframing of the ISO's versions of "understanding" in the design process as "empathy" (Figure 9). IDEO has proven extremely popular for entrepreneurs and innovators, including those within humanitarian and development communities.

Fig. 9. IDEO Design Process

IDEO promotes "We use human-centered design to create products, services, and experiences that improve the lives of people living in poverty." (IDEO, 2018) The Stanford d.school also explicitly promotes this brand of "HCD" for the purpose of social innovation and re-designing how people work (Stanford Design School, 2017). Even as that redesign remains up to the decisions (however empathetic) of the designer (Both, 2018).

The repackaging of user-centered as human-centered has won the interest of many humanitarian and development agencies looking to innovate for more sustainable solutions in communities. The leading school of thought within the USAID Global Development Lab (GDL—which is an evolution of public-private partnerships division and distinctly separated from the field-work of USAID (USAID, 2018)) —embraces this disjointed view of HCD. The GDL is a strong proponent of market-based solutions to poverty, and has partnered with like-

minded theorists who believe commerce is the best solution to social equity problems (e.g. MIT Lab, Stanford Design School).

While this interest has reaped some success in product innovation more appropriate for the communities the products serve, there is little evidence that the confines of market-based solutions has reaped sustainable solutions to humanitarian problems (Jacobsen, 2015; Read, Taithe, & Mac Ginty, 2016; Touray, Salimnen, & Mursu, 2013). In turn, the rebranding of UCD as HCD and thus, as design for the well-being humans, has reached a resulting backlash toward HCD by the humanitarian and development community. A recent Co-Design article called out the "cult of human-centered design" whose "*focus on empathy and understanding users, their values and experiences that has made designers stand out as modern-day humanists casting a renaissance light in a world transformed by technology*" (Girling & Palaveeva, 2017). These authors re-recognize the same shortfalls Bertalanffy touched on 60 years ago, and Ackerman in his essay of the socio-technical gap: "by focusing on the individual user alone, we often fail to take into account broader cognitive and social biases. By zeroing in on the short-term impact and benefits of our designs, we spare ourselves asking the really hard question: Are we designing a world we all want to live in today and tomorrow? (Girling & Palaveeva, 2017)

UCD leaves Bertalanffy's divide to persist between technology design and the values and practice of humanitarian field-work. Humanitarian organizations and even non-profits and society at large, however, remain in great need for us to address this gap in "*systems philosophy*" and "*systems technology*," to where we can progress ICT solutions more effective for the non-profitable realm.

d) HICT as an Existential Threat to the 'Socio-': Humanitarian Practice

Beyond the need of identifying the specific humanitarian socio-technical gap, some socio-technical researchers brush near reference to this critical barrier to effective design of socio-technical systems: design's lack of accountability to the **"socio-"**. In his call for a new field of Socio-technical Systems Engineering (STSE), Baxter alludes to the broader disconnect observing, "Systems often meet their technical 'requirements' but are considered to be a 'failure' because they do not deliver the expected support for the real work in the organisation" (Baxter & Sommerville, 2011). That ICTs are only "considered" a failure in these common cases—versus actual failure—pinpoints an overlooked responsibility of ICTs to account for their alignment with, and impact on, the broader work-system.

As discussed in the previous section, technology design is technically accountable, contractually, to the engineering requirements of a system. Technology creators currently do not assess their products through the lens of whether it will meet or conflict with the socio-requirements, much less how it will alter the socio- system. Without considering the technical system as an intervention within a greater system of interconnected systems that guide and execute the work—organizational culture, the work environment, diverse stakeholders needs, changing relationships—the "system" fails (Baxter & Sommerville, 2011). Although the technical research is limited in its sharing of stories of "actual" failed technology, there are ubiquitous testimonies of humanitarian technology initiatives that fail to achieve their desired purpose (Toyama, 2015; Walton R. , 2011); to adapt to the needs of the humanitarian community (Tomasini & van Wassenhove, 2009) ; or to be adopted or achieve adequate scale (McClure & Gray, 2015). The UNHCR Innovation unit has concluded such phenomena with: "In many cases,

well-intended developers find themselves confronted with the realities of operating in an unfamiliar and challenging context" (UNHCR, 2016). Baxter and Somerville agree, attesting that, "the source of the problem is that technocentric approaches to systems design do not properly consider the complex relationships between the organisation, the people enacting business processes and the system that supports these processes." (2011) They observe, while systems might "work" from a technical perspective, they still do not succeed in delivering the needed support to the core work of the organization.

Within the humanitarian work system, technology must be able to adapt and accommodate the larger human system that drives its success. Without bottom-line consequences for makers of technology to assess their design for its accountability to the "work" for which the organization is accountable, ICT will continue to fail the broader mission of organizations (and to be monetarily rewarded for it.) Thus, humanitarian ICT communities still have a long way to go before adequately accommodating the humanitarian principles that guide humanitarian work. Consequently, this puts the central position of the humanitarian principles within the larger socio-technical work system at grave risk.

Sociomaterialility.

Orlikowski proposes "**sociomaterial**" as a term to refer to organizational work practices in order to "*explicitly signify, through our language, the constitutive entanglement of the social and the material in everyday organizational life*" (Orlikowski, 2007). She gives traction to the term sociomateriality to explain the dual nature of influence, planned or not, that practice has on changing technology and that technology has on changing practice. (2007). Her focus acknowledged the importance of the role and relationship between technology and human

interaction, and understanding how it influenced the way people reflect and assess the value of technology (Feenberg, 1991; Dysart-Gale, Pitula, & Radhakrishnan, 2011). Thus, when technology design doesn't acknowledge foundational assumptions about work-system values embedded in everything from basic methods to best-practices (aka- Latour's 'black-boxes' (1987)), its application risks creating detrimental consequences to the practice, and within the humanitarian work-system, it risks its ability to meet its core humanitarian objectives and hence save lives (Sandvik, Jumbert, Karlsrud, & Kaufmann, 2014; Walton R. , 2011).

This is an overdue, urgent concern for humanitarians. While there are many research lines looking at how people co-opt technology and use it in ways and for things in positive ways that weren't intended (Walton R. , 2011), and recognition for how technology has changed day to day activities of people (e.g. the addiction to checking email that the phenomena of the blackberry inspired (Orlikowski, 2007), there is little study of the impact of technology on changing humanitarian field-practices. Beginning in 1993, Orlikowski was already talking about the importance of recognizing cognitive, organizational, and structural elements as part of the design process of new technologies, as well as their implementation in organizations (1993). Yet, Orlikowski and Scott in reviewing four of the top organizational science journals found that 95 percent of articles did not acknowledge the role of technology in practice (2008).

In Feenberg's Critical Theory of Technology, he observes society and technology "*communicate constantly through the realization of values in design and the impact of design on values"* (p. 68). He reminds us that while the requirements document (ref: page 57) carries unseen bias into ICT about the work and its values, which are not the humanitarian values and yet will impact the humanitarian mission. Suchman leveraged on workplace ethnography to

highlight how work is done breaking it down "*not as independent organization process, but as part of the fabric of meanings within and out of which all practices are made"* (1995, p. 58). Derived from this, is the pursuit of creating a social understanding which needs to be encompassed during the design process of technology as it is not neutral to organizational culture and vice-versa (Winner, 1980; Feenberg, Critical Theory of Technology, 1991). The role of technology is situated as an intervention within a complex system of systems, supporting human work.

The current lack of regard for humanitarian accountability within HICT does hold harsh consequences for humankind. Paolo Freire drew attention to a critical imbalance of power and control present in processes of technology that are incompatible with humanitarian values highlighting the danger of "*a privilege that dehumanizes*" (1970). Under great opposition to the politics of the time, Freire boldly spoke about the use of science and technology as instruments that maintain a "prescribed" imbalance of power and freedom. "*oppressors [use] science and technology as unquestionably powerful instruments of their purpose*" (1970, p. 60). This power, currently unaccountable to the people HICT serves, cannot be reconciled with the humanitarian values. Specifically, within the humanitarian work-system, technology must be able to adapt, accommodate the larger social accountability to humanitarian principles that defines its mission.

Thus, while Western society has experienced and continues to undergo painful reckonings to account for structural imbalances that marginalize and dehumanize, the design of humanitarian ICT has yet to be called into account for assessing its impacts on the humanitarian mission.

D. HICT AS A HUMAN-CENTERED SYSTEM

Where socio-technical scientists have achieved some understanding of the design needs for these alternate problem-spaces can be seen in design approaches for human-centered systems. Kling and Starr's Human-Centered Systems (HCS) reflects an effort by researchers 20 years ago to describe a new computing field in designing for collaborative informational work—one, I contend, HICT design must return—where specifically human knowledge and skills merge with technology to form a social-technological system (e.g. advanced weapons systems, telemedical systems, digital libraries) (Kling & Star, 1998). Within this context, humanitarian work is not human-centered because humanitarians serve humans, rather it is human-centered because it depends on humans to do the work—a people-driven work-system. Further, a human-centered system (HCS) is not referring to the larger human work-system alone, but rather the synergy of the technology to optimize the "non-mechanical" capacities of humans working together (Kling & Star, 1998). As such, human-centered design (HCD) refers not to the design of technology alone, but to the synergistic design of technology supporting human capacities and their distributed knowledge. Or put another way, HCSs are technologies being designed to support human capacities within their real-world work environment.

Kling and Starr robustly acknowledge the unique challenges for designing for the socially collaborative aspects of an STS. This includes acknowledging: (1) human skills and capacities as the primary system and the STS as a support, not replacement to that system (e.g. articulation work); (2) ecosystems and infrastructures of work contexts (e.g. multi-modal communication); and (3) the dynamic and ongoing nature of change in organizational work-systems. These considerations bring a closer alignment to the challenges of designing HICT. Designing for HCS

sketches principles for widening the boundaries of the problem space across Bertalanffy's three pillars—introducing into the design conversation particulars around: process, the how, stakeholder participation, the social and collective, values, whose problem? whose design?

Given the hidden and contradistinctive natures of both the practice and the design assumptions embedded within ICT, these questions become incredibly important if we hope to achieve more effective design of HICT.

E. A Case for Grounded Study of the Shared Practices of Successful Humanitarian Field Practitioners

Thus, the conceptual argument in this chapter presents a the predicament of our current knowledge gap--that for information and technological tools and measures for humanitarian practice to be meaningful and relevant, their design must be informed by a deeper understanding of the role of information within that practice. In other words, closing the humanitarian sociotechnical gap first requires that we "*know what we need socially*" (Ackerman, 2000). Contradistinctive from market-based operations and the technology designed to support them, humanitarian agencies mission-based goals cannot be reversed engineered. Operating in dynamic and highly contextual environments result in a high level of implicit expertise requires uncovering (Suchman, 1995). Further, critical meaning predominantly resides buried in the qualitative noise of culture, context and is poorly communicated via current quantitative measures (Renzaho, 2007). Rather, formulas for success are embedded within the everyday practicalities of doing the work as it interacts with the world—the practice (Orlikowski, 2007).

This section has highlighted how the nature of humanitarian field-work results in highly autonomous ways of operating to support their impact-oriented mission (Lindenberg & Bryant,

2001; Hilhorst, The Real World of NGOs: Discourses, Diversity and Development, 2003). Specifically, in regards to change adoption, which can be relevant to technology adoption, "*one of the most important barriers to change in NGOs is the strong, individualistic and independent style of staff,*" (Lindenberg & Bryant, 2001, p. 56). Humanitarian Organization's unique need to accommodate maximum uncertainty, and field-level practitioners decision-making necessitate flexible (as opposed to standard) operational procedures to allow for wider adaptation in the field—making their ways of operating one of the most hidden aspects. Thus, research that can appropriately inform the management of humanitarian information must be rooted in a deep understanding of humanitarian values—particularly the values of autonomy, independence and self-determination.

Further, it suggests that Bertalanffy's initial defining of general systems theory must incorporate a principle he largely scathed--that is, that all decision-making is not only individualistic. His "*ultimate precept*" was that "*human society is based upon the achievements of the individual*" harshly rejecting gravity of social norms (1968, p. 53). However, a social perspective is needed to bridge between the three pillars. He reflects briefly on the dilemma of "free-will" and individual autonomy meeting with the world of "determinism" created in the history of our approach to science, but fails to acknowledge a social decision-making that manifests in social norms and values. An economic-centric world view ascribes to the individual as having power to overcome and yet, remains unclear and questionable how individuals can impact and affect change within the greater economic, social, and cultural systems. Amidst the stove-piping and categorizing efforts to name and position activity Bertalanfry identified—and current day analyzing of the causal dimensions of the world via economic-minded paradigms—

there is yet another pertinent, yet problematic question to address—how do we address the moral dimension?

This is a critical conversation for technology design. Economic systems attempt to be distinctly neutral from **normative** claims of society, and leave the good or bad of the system as "personal preferences subject to a bargaining process between **individuals**'" (MacIntyre, 1984). MacIntyre argues that such utility-centered systems create a "*culture of effectiveness [that] situates society as a collection of self-interested individuals who bargain for mutual benefit*" (Horvath, 1995). As such, effectiveness within a quantitative, utility-centered construct, is specifically absent of intrinsic measures for assessing a system as a *morally* 'good' or 'bad' system. Because moral or immoral conviction cannot be quantified,[45] the humanitarian systems legal obligations to a mission defined by a moral code of conduct lend themselves to more qualitative standards of meaning.

HICT has not produced the impacts that we would expect. Their efforts have been misaligned with a focus on market-oriented views of effectiveness. This framework of effectiveness, devoid of the ability to gauge a system against social norms, is also not easily constrained by them. While this may be possible for economic systems, it is not the case for humanitarian systems. In order to advance a more compatible "-material" for the "socio-"—as Orlikowski and Suchman beckon us—we require a grounded understanding of humanitarians at practice. This study begins the important modeling of humanitarian information practices.

[45] "Not everything that can be counted counts and not everything that counts can be counted." Ibid #25

III. Study Overview & Methods

A. Study Overview

I conducted an 18-month, grounded, qualitative, ethnographic study that sought to understand practitioner information needs by asking the question: **What are successful Red Cross/Red Crescent (RCRC) practitioners already doing that works, and how can the organization better support their information needs in what they are already doing?** The study consisted of 116 interviews conducted across the five regions and multiple levels of the RCRC movement to include six, two-week visits to national societies where the research team observed and interviewed practitioners who had been named as doing good work by their peers within RCRC.

The primary information and organizational support needs of successful practitioners, i.e. **What information do successful practitioners need the most for success?** and **Where is it already being successfully accessed or provided?** did not reveal the expected results of need for specific outside technical knowledge or technological capacities. Rather, participants revealed information most needed for success was information that resided in communities. Further, this information wasn't needed primarily for the practitioner nor organization's consumption and use, but for the community, itself. Successful practitioners' most critical information needed for success is primarily accessed through their core work of interacting with communities.

B. Research Design

Due to the uncertain, multi-variate, and highly contextual nature of humanitarian work, academic research is predominantly in the form of case studies with limited transferable research exploring patterns across contexts. To address this gap, I present my findings from this phased, 18-month interpretive, qualitative research project that used primarily ethnographic methods to construct a grounded theory approach to understand the critical information needs of practitioners working directly with affected communities in disaster preparedness and response. This research provides common themes across all contexts constructed into a theory of successful field-practice and the information practices that support successful humanitarian outcomes.

The field-work component of this study consisted of 116 interviews and six two-week ethnographic, observational field studies. Our interviews and observations were with practitioners of the International Red Cross-Red Crescent Movement (RCRC) who were named for doing "good preparedness work," within their work environment. The RCRC is not only a large, reputable, well-established international humanitarian organization, signatories to its code stand as the guiding membership from which legitimacy for not-for-profit agencies working in the humanitarian context stems.

My research is the product of a rigorous, iterative qualitative coding and analysis of the interview data by a trained, diverse team of qualitative researchers. For our analysis, we used a grounded theory approach, where what is deemed important comes from the data (grounded), or is defined by the significance and repetition of information found across practitioner experiences.

Field research consisted of three phases. Phase 1 and 2 were scoping phases and Phase 3 was an in-country ethnographic field study and sought to reveal what information successful

practitioners find most essential to the success of their work across contexts. Phase 1 and 2 consisted of activities to scope and guide the intensive final phase 3 in-country visits, interviews and ethnographic study.

1. Research Assumptions

a) Much of humanitarian work is hidden.

Humanitarians operate in highly decentralized, and dynamic situations. They work in geographically distributed, and logistically, difficult-to-reach locations in an atmosphere of rapidly changing information, rendering situationally specific, and dynamically developing ways of operating. Not only is humanitarian work physically difficult to see, its practice is also "hidden" from collective organizational awareness, with key success factors existing within implicit expertise, informal relationships, unstructured communication, informal social networks, and unwritten work practices. These hidden success factors are difficult to bring to light because a) it is impossible to wholly observe a highly dynamic, diverse and decentralized work system in action and b) making implicit knowledge explicit requires a high degree of practitioner collaboration and reflection. A primary aim of this research was to facilitate successful practitioners in making hidden knowledge more explicitly known, through listening to, observing and distilling the points of view, work-practices, and information needs of peer-identified, successful practitioners.

b) Practitioners on the ground are the key decision-makers and informants.

Humanitarian practitioners closest to the vulnerable communities are the primary decision makers for the execution of successful operations within humanitarian operations. They are positioned with the most complete and relevant information for meeting the organizational

objectives, and the power and authority to execute the decisions. For information tools and measures for disaster preparedness and response to be meaningful and relevant, their design must be informed by a deeper understanding of how practitioners are doing the work, the values the work supports and the role of information in that work. A primary aim of this research was to facilitate successful practitioners in making hidden knowledge more explicitly known, through listening to, observing and distilling the points of view, work-practices, and information needs of peer-identified, successful practitioners.

c) Successful work can be best defined via peers.

In specialized fields, robust with hidden work, it can take years to understand the work and organizational cultures. Specifically, what constitutes successful or effective work in humanitarian contexts remains an unarticulated mystery even within humanitarian communities. Therefore, peer recommendations more credibly allow those who know the work best—fellow colleagues—to point us towards success. Likewise, in a field with dynamic, varied, and even conflicting views of success, using peer recommendations enables a picture of success to emerge from patterns across the many perspectives, contexts and experiences of practitioners. Therefore, we intentionally avoided imposing an outsider definition of "success" for this study. Instead, we asked participants to identify and describe good work, thereby allowing the definition to emerge from the data.

2. Researcher Perspectives

Due to the highly multi-cultural (inter-disciplinary, intra-organizational and geographic) and hidden nature of humanitarian work we used a joint emic and etic approach to meet confirmability rigor (Lincoln & Guba, 1986) including representatives of inter and cross-

disciplines, who are representative of the different cultures involved. Therefore, our coding consisted of an insider-outside perspective, ensuring at least one coder with humanitarian experience, and one qualitative researcher who participated in the in-person interviewing. Where possible, we also included a host nation researcher interview participant (four out of six countries).

Each student researcher involved in coding conducted reflective written exercises on their backgrounds, perspectives and assumptions about humanitarian and development work, effective-work, and quantitative vs qualitative approaches. They also completed relevant reference background reading, listened to at least two audio interviews and were trained in qualitative, constructed analysis, open and focused coding methods.

As the author of this dissertation, I bring into my research an insider perspective with an 11-year career committed to advancing humanitarian care for those affected by disaster and oppression. I have worked inside all the various perspectives of relief—as part of the UN, inside the US Government's disaster response teams (USAID) and then as head of disaster logistics preparedness and planning for World Vision International (WVI), a leading non-governmental organization (NGO)—participating in operations at the field and strategic levels.

3. Rationale & Significance

As well-established in the background, humanitarian work differs from other kinds of work. Yet, research investigating the effectiveness of organizational support for humanitarian work remains unattended and predominantly understudied from the perspective of the actual practice of the lowest level practitioners engaging the work. The ability of impacting improved

humanitarian practice technology design, is squarely dependent upon the ability to build stronger empirically situated understandings of successful and effective humanitarian practice.

a) Design:

This study addresses the gap in understanding how to more effectively design technologies for humanitarian field-work by addressing a symbiotic relationship between technology design and a work-system's values and goals, as demonstrated in successful practice. The values and goals of humanitarian work drive a need for design considerations and approaches that accommodate the humanitarian perspective of what is effective. As outlined in the previous chapter, common technology design approaches grounded in understandings of effectiveness in terms of for-profit and top-down hierarchies are inadequate and inappropriate for accommodating human rights and humanitarian principles, goals and ways of working. The gap in understanding the different design and values of the work leads to a gap in both effective organizational support design and effective technology design. If we are to design effective technology for humanitarian organizations and missions, they must be guided by an understanding of successful and effective humanitarian practice.

b) Practice:

To inform the successful and appropriate design of information technologies for humanitarian organizations and practitioners, we first need to increase our understanding of effective humanitarian practice. This includes understanding and incorporating the environment and values that underpin the definition of that success. My research aims to contribute to the future development of preparedness and response support products and outputs by identifying those factors most central to successful field practice, and therefore central to designing future

mechanisms for effective organizational and technological support. While not fully addressed in this dissertation, I have delivered a technical report available to practitioners and continue take forward research for practical application. The predominant focus of this dissertation is on implications for design.

C. Methodology

1. Overview

This is a qualitative, three-phased research study consisting of 116 interviews that included six two-week observational field studies of practitioners within countries representing diverse regions and contexts of a large well-established international humanitarian organization (Red Cross/Red Crescent Societies (RCRC) doing "good preparedness work." The data analyzed comes from an interpretive, qualitative research analysis that used primarily ethnographic methods and a constructed grounded theory approach (although constructed themes and description of phenomena are not extended into full grounded theory.) Phases 1 and 2 were scoping and guiding phases and Phase 3 was the in-country ethnographic visits.

Phases 1 and 2 interviews together provided perspectives across all of RCRC's five geographic regions (and 16 countries) and levels of the organization (e.g. international, regional, national, branch), in countries representing diverse disaster risk and preparedness contexts. Interviews were recorded and transcribed and jointly coded through a software program[46]. Interviews transcripts were separately open-coded post Phase 1, and then across each country

[46] Old Saturate App

and interpretively analyzed. Focused codes were developed from Phases 1 and 2 from in-common themes for development of our in-field observation worksheet and guided our Phase 3 research questions. The six, two-week long, in-country, ethnographic studies comprising Phase 3 were in the countries of Colombia, Jamaica, Burkina Faso, Uganda, Kyrgyzstan and Nepal. We then conducted iterative focused-coding by six student-researchers to look at the patterns that existed across countries for these in-common focused codes. Finally, we collectively and iteratively analyzed for the meanings and connections into the themes presented in our findings.

For increased credibility, elements of prolonged engagement achieved through: (1) field immersion and numerous respondents; (2) persistent observation achieved through saturation of themes; triangulation achieved through multiple investigators; (3) member checks via interviewing restatements; and (4) peer debriefing in the form of a report findings presentation to participants. Rigorous elements of transferability were obtained by coding for themes found across all contexts (except where otherwise stated). Due to the highly multi-cultural (inter-disciplinary, intra-organizational and geographic) and hidden nature of humanitarian work we used a joint emic and etic approach to meet confirmability rigor including representatives of inter and cross disciplines and representative of the different cultures involved as researchers throughout the study. Finally, the unique criteria of authenticity were also considered ensuring representative levels of the organization were interviewed (fairness) and participants were (1) pre-briefed for consent, (2) provided their diverse evaluations of relevance of success in their interview responses, and (3) participated in the final presentation.

Understanding Success

We intentionally avoided imposing an outsider definition of "success" for this study. The humanitarian field has a long history of assessment—of analyzing practices and programs to determine their level of success—but there are wide and varied perspectives on what success might mean. Our research design focused on understanding success from those who know the work the best; and are known for their "successful" work among their professional peers. We asked participants to identify and describe good work, thereby allowing views on success to emerge from the data. For a specialized field where it can take years to understand the work and organizational cultures, peer recommendations more credibly allows those who know the work best—fellow colleagues—to point us towards success. Likewise, within autonomous and hidden aspects of field-work where there are dynamic, varied, and even conflicting views of success, using peer recommendations enabled a shared picture of success to emerge from patterns across the many perspectives, contexts and experiences of practitioners.

2. Phases 1 & 2

In Phases 1 and 2, we spent the first six months scoping the project: reviewing existing organizational documents and studies and conducting 20 interviews of preparedness practitioners who are recognized by their peers for their expertise and experience in preparedness. This initial subset was representative of persons with extensive field experience serving in all regions (16 countries) and across the different levels of the RCRC movement (e.g. international, regional, national, branch; Fig. 10). We identified interviewees by asking peers to identify (1) where a good response and preparedness work being done?, (2) who is doing good work?, (3) why do they consider that work to be good?. The aim was to predominantly reach those implementing work at the community level. The picture of success that emerged from peer-recommended

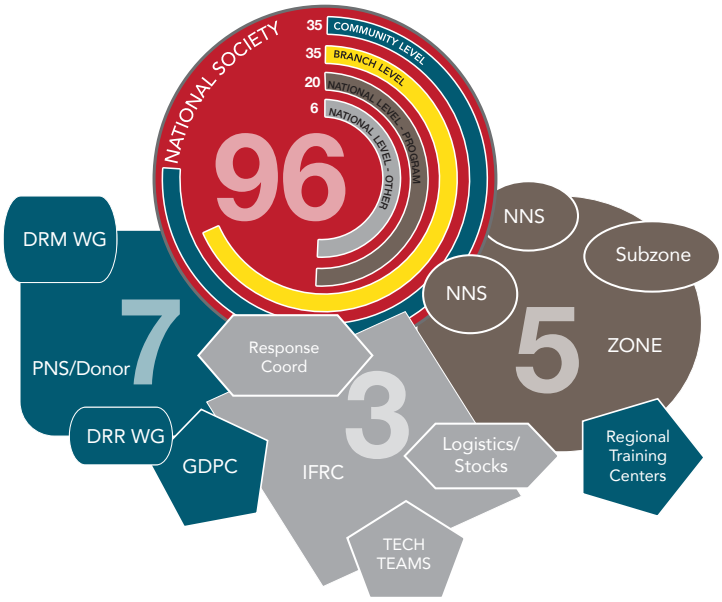

Fig. 10. Organizational Elements of RCRC with Number of Interviews Conducted. Overall 116 interviews were conducted across all 5 regions and multiple levels of the RCRC, with an aim to reach those predominantly at the community level. This graphic depicts primary partnering national society (PNS), international (IFRC), and regional functions named for their involvement in the disaster response & preparedness work of national socieities.

practitioners showed that good response and preparedness did not necessarily represent a particular iconic example or definition, but rather revealed a wide variety of examples in consideration of different influential constraints, and a variety of profiles. The early interviewing and scoping work of Phases 1 and 2 that included review of current, pertinent internal RCRC studies, processes and tools, allowed us to develop an understanding of the structures, relationships, mechanisms, and definitions of preparedness within RCRC.

In these phases, a team of five researchers spent the first six months scoping the project. This team consisted of one highly experienced humanitarian practitioner-researcher (author-principle investigator), one highly experienced qualitative humanitarian researcher (co-principle investigator) and three student researchers, of which one systems engineering student held two years of overseas development experience, one international development student held two years of study in international development, and one design student with limited to no experience with

humanitarian and development work. All team members participated in conducting, transcribing and listening to at least half of the Phases 1 and 2 interviews. All team members reviewed existing organizational documents and studies named as relevant by the key informant and subsequent interviewees, as well as more general reference materials and guiding documents representative of the foundations of humanitarian practice (as identified and assigned by the author).

The principle and co-principle investigators conducted seven interviews in Phase 1 and 13 additional interviews in Phase 2. All interviews were approximately one hour long and were audio recorded, with notes fleshed out immediately after interviews. Participants were initially recruited from a larger list of names provided by our key informant of persons known for their successful work within preparedness and response. With each subsequent interview (Phases 1, 2 and 3), we identified interviewees by asking peers the same three questions (Where is good response and preparedness work being done? Who is doing good work? Why do they consider that work to be good?). This resulted in recruiting those who were named most frequently amongst participants**,** with an aim to predominantly reach those implementing work at the community level. We did not interview anyone not named for doing successful work. Secondary research included review of current, pertinent internal organizations studies, processes and tools, and allowed us to develop an understanding of the structures, relationships, mechanisms, and

definitions of preparedness within the organization.[47] (See Figures 10 and 11; and (Mays, Savino, & Walton, 2013))

Phase 1 included interviews with (1) five emergency preparedness experts in different nations and organizational levels, (2) the key informant with the organization, who serves as the liaison between our research team and the organization, and (3) a small group of employees who recently conducted an internal study of organizational capacity relevant to emergency preparedness and response. Open-coding consisted of looking at themes that emerged from the data. For increased inter-coder credibility, this was conducted by the first two authors separately (noting the increased credibility of including both perspectives) who then came together to share codes, categories and perceived meaning and then using a modified-card sorting approach codes were written on post-its, shuffled and re-constructed into new thematic groups giving joint focused themes for forward analysis. The picture of success that emerged from peer-recommended practitioners showed that good response and preparedness did not necessarily represent a particular iconic example or definition, but rather revealed a wide variety of examples in consideration of different influential constraints, and a variety of profiles (figure 11), guiding our Phase 2 work for grouping and identifying representative countries for in-country visits. The focused themes guided our construction of Phase 3 questions and observations guide.

[47] Organizational elements depicted in figure 10. Preparedness Attributes in figure 11. Also see Mays R. E., Walton R. & Savino, B. (2013, Oct) "Thirty years of practice: the evolution and emergence of a more holistic view of preparedness." Paper presented at World Conference on Humanitarian Studies 2013, Istanbul.

In phase 2, we identified candidate countries for our Phase 3 in-country visits by grouping countries with medium and lower Human Development Indexes (HDIs) according to attributes (such as resources, disaster profile, frequency of disaster, and geography) identified by practitioners as affecting their definitions of "good" preparedness work.

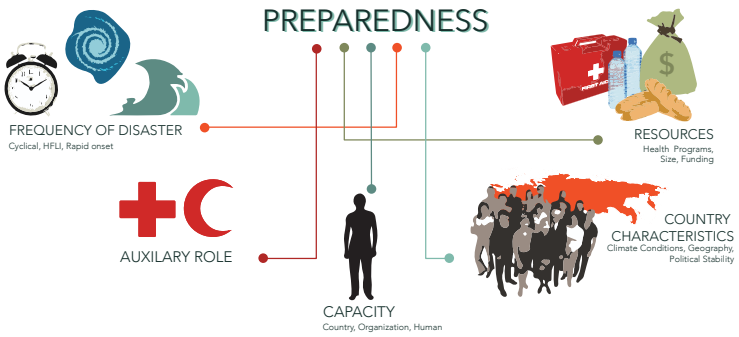

Fig. 11. Preparedness Attributes. In order to nominate a more widely representative set of candidates, we used publically available data proxies for attributes identified as relevant for prepare dness and response. (For example, low HDI as a proxy for resources.) and levels of the organization (e.g. international, regional, national, branch). Phase 1+2 work guided our development of phase 3 research questions and our in-country observational guide.

Our early interviews revealed various attributes that practitioners identified as relevant within their assessment of "good" preparedness and response work. To nominate a more widely representative set of candidates, we used publicly available data proxies for these attributes. For example, we used Human Development Index (HDI) as a proxy for capacity. Our six resulting representative groups were 1) Low HDI, 2) Low Stability, 3) Rapid Onset, 4) Cyclic/Slow Onset, 5) High Impact/Low Frequency, and 6) Islands. While grouped countries according to their strongest rankings in those attributes, all have multiple attributes and micro-climates that may be representative of other attributes, as well. For example, while Uganda provided us a representative low stability country by the proxy data, we also observed good work that

happened to be addressing drought (slow onset). At the end of phase 2, we developed a candidate list of 22 countries across six groups for the two-week in-country ethnographic studies comprising Phase 3.

Phase 2 interviews extended to the point saturation what we learned about the organization, our list of candidate countries, and participants for phase 3. Phases 1 and 2 interviews together provided perspectives across all five RCRC geographic regions (and 16 countries).

3. Phase 3 – Field Visits

Six national societies named for doing good work, that were representative of our preparedness-relevant categories, all geographic regions, and able to participate, became the focus of our Phase 3 visits: Colombia, Jamaica, Burkina Faso, Uganda, Kyrgyzstan and Nepal. We then conducted a total of 96 additional one-hour interviews within these societies, using local bilingual researchers as cultural and linguistic translators. In-country study transparency and culturally relevant customs were followed which included pre-coordination of materials to participant groups, an introductory presentation to leadership, and in some cases headquarters level accompaniment to field observation sites. In addition to interviews, within each country, successful practitioners or practitioner teams at two to three locations were observed for two to three days conducting their work within their workspace, offices and interacting with communities and coworkers. Researchers observations were annotated, and artifacts that emerged were photographed and participants also provided artifact descriptions of use in follow-up questions.

4. Analysis

Following our country visits, interviews transcripts were separately *open-coded* across each country by two to three coders using the Saturate online qualitative coding tool. For rigor, our coding consisted of an insider-outside perspective, ensuring at least one coder with humanitarian experience, and one qualitative researcher who participated in the in-person interviewing. Where possible, we also included a host nation researcher interview participant (four out of six countries).

For the closed-coding, or thematic coding six student-researchers conducted iterative focused-coding to look at the patterns that existed across countries for these in-common focused themes, again using the Saturate online qualitative coding tool. Each set of country interviews were then focus-coded by two researchers. We collectively and iteratively analyzed the focused-themes for the meanings and connections into the theory of information practices presented in our findings below.

5. Limitations

- A more formal testing of the findings with a representative sample of stakeholders would increase rigor and credibility.
- Language translation/transcription limitations. Translators were requested to translate for meaning. We improved on this as we progressed across countries.
- Countries undergoing extraordinary conflict situations were not included within this study.

- While we studied a wide breadth and balance across contexts and project types which includes response work, the majority of our access was within the context of preparedness and development of communities. It lacks purist attention to the art of response.
- Communities are diverse with various stakeholders and opinions. Often when I speak about communities within the research, it can appear that I am speaking about a unified and uniformly spoken group of citizens. This is not the case, even in agreement there always exists diversity of opinion and experience.
- The scope of this study is in terms of information needs—while to analyze critical information that mattered, it pointed to a framework of how practitioners perceived success, it is not representative of all successful work.

IV. Findings

The findings show practitioners' primary information needs are work-practice needs. They emphasize gaining the capacities and resources for working with communities to more effectively reflect the community's own knowledge back to them for discovery and action. As such, the results of this study go beyond a narrow understanding of information and where it is accessed to bring forward a broader understanding of information as a dynamic, multi-directional, social interactive phenomenon, compared to a static or fixed quantitative or qualitative data. This finding also highlights the need for organizational support in field work-practices more generally.

1. The Wheel of Successful Practice

The overall findings convey those factors and behaviors for accessing and managing information that consistently emerged as relevant to the success of practitioners across all the countries we studied. Principally, we found that practitioners' primary information needs reside within the evolving community-practitioner interaction. The interaction is characterized by a work-practice concentrated around four dynamics the successful practitioner **Must-Have** (MH) for both the information most needed to emerge and for success, itself, to be achieved. Each must-have progressively builds (and depends upon) the previous must-have to bring success. The arduous work of building **community trust** (Must-Have I) and the practitioner's advanced skills for facilitating (depicted by the yellow arrow) an **organized community** (Must-Have II) are not just an ends unto themselves, but are necessary in the progression of a **community** towards acting in **agency** (Must-Have III) and eliciting the information needed for achieving sustainable,

long-term impact (Must-Have IV). Within each of these four phases of must-haves, we have organized the findings around 11 Success Factors (SFs) and Information-driven Behaviors (IDB) which explain the primary ways those success factors are enacted consistently across contexts. I depict the the three levels of results as a Wheel of Successful Practice (WSP, Fig 12, p. 90):

4 Must-Haves (MHs) - WHY are practitioners doing what they're doing?

Must-haves are a progressive flow of four dynamics at the center of attention in successful practitioners' work-practices to access the information needed for success. Successful practitioners draw out communities' self-knowledge and present it back in a way that brings about the agency and long-term resilience of communities. These four areas dominated the time, energy, and focus of practitioners and explain WHY practitioners are doing what they are doing. We found these in-common "must-haves" to be progressively attended to across preparedness and response activities, sectors and contexts.

11 Success Factors (SFs) - WHAT are successful practitioners doing?

Success Factors, broken out within each phase of must-haves, are WHAT practitioners are doing that is working across contexts. Although variations existed across contexts, practitioners share these common factors as central to their success.

30 Information-Driven Behaviors (IDBs) - HOW are they doing it?

Embodied within each success factor, we have identified the shared ways of HOW practitioners are enacting those factors. While variations necessarily may exist across contexts, these are the shared core components of the ways that practitioners are enacting success.

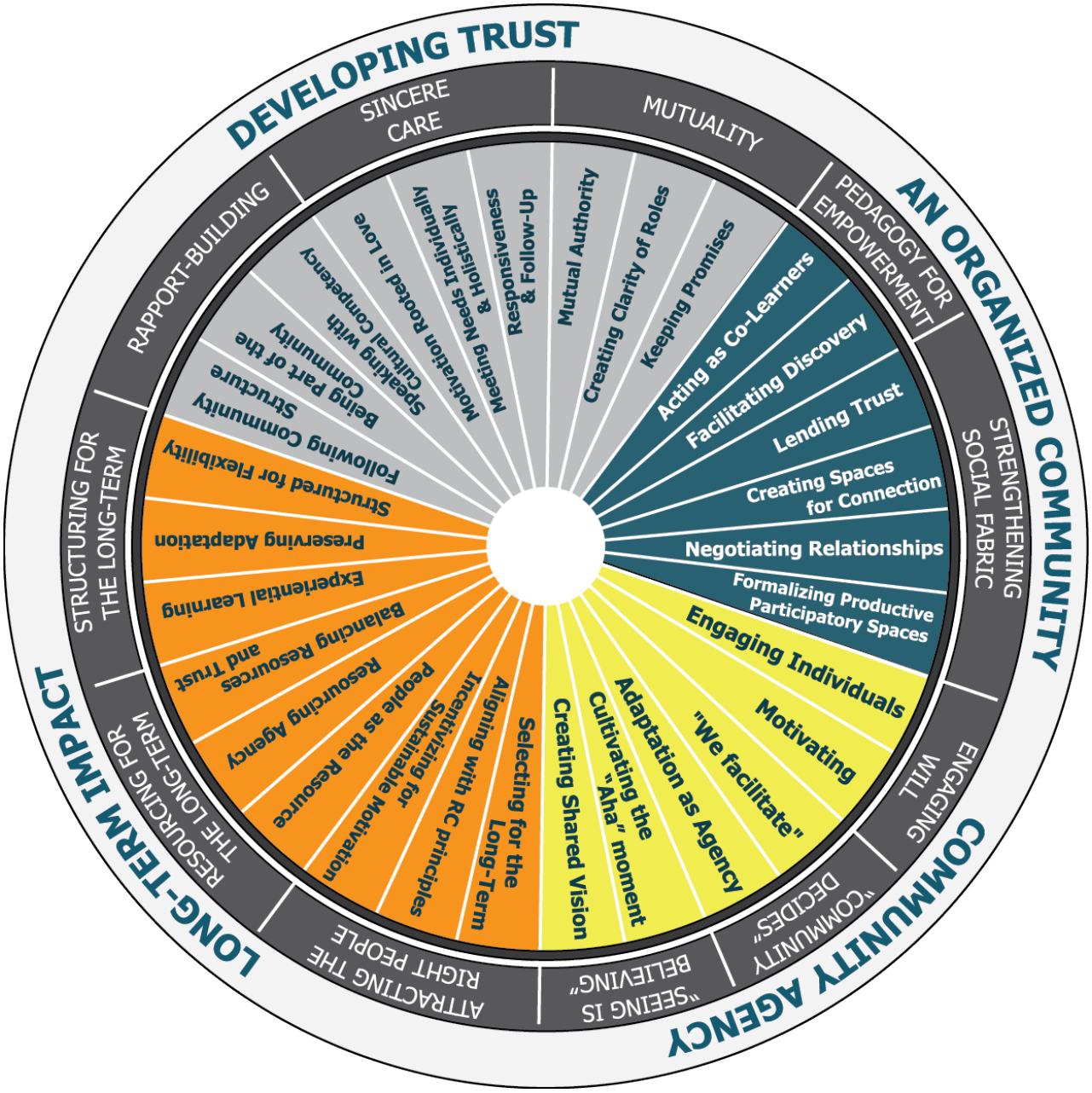

Fig. 12. **The Wheel of Successful Practice (WSP)**

The findings paint a detailed picture of what successful practitioners across contexts viewed as the most important factors needed to access information needed for success. We were surprised to find practitioners repeatedly identifying needs revolving around effective relationships and pedagogy, far surpassing descriptions of technical information, data or tools. The results emphasize the skills, time, authority and resources required to (1) effectively build trusting relationships with communities; (2) manage, administer and facilitate group dynamics; (3) motivate, learn, iterate and adapt programs within the local and peer communities; and (4) achieve wider organizational understanding and support around impacts on these essential information elements within organizational decision-making and delivery of programs. These findings suggest that the overall challenge to RCRC is to evolve its various organizational and information systems to better recognize, preserve, and improve the often hidden and complex two-way interaction between the community and the practitioner.

2. Successful Information Practice

Practitioners revealed that their most valued information—the information they most needed for success—is predominantly situated within the community members, themselves. Overall, we found that practitioners' primary information needs reside within the evolving community–practitioner interaction. The interaction is characterized by a work-practice concentrated around four dynamics the successful practitioner must have for both the information most needed to emerge and for success, itself. The must-haves are four dynamics at the center of attention in successful practitioners' work-practices. Although practitioner efforts may be addressing any of these must-have at any point over the course of their work, there emerged a distinct common chronology in the way practitioners talked about their success—a

progressive realization of must-haves when things worked well. We have captured this progression in the following phases. A practitioner's ability to access information critical for achieving success specifically depends on the foundation built by earlier phases. We found across contexts, practitioners achieving success **must-have** the following (Figure 13):

Fig. 13. The progressive Must-Have's for successful humanitarians outcomes.

I. Community Trust: Knowing the Community and Being Known

II. An Organized Community: A Connected and Aware Community

III. Community Agency: A Community Acting & Advocating for Themselves

IV. Long Term Impact: Ensuring the Work Takes Root

From the practitioner's viewpoint, knowing the community and being known in the community establishes a genuine trust relationship with the community -> A practitioner must have **community trust** in order to effectively facilitate a community to become better connected and aware. -> A practitioner must have the skills to facilitate reflection and discovery, and strengthen connections (depicted by the yellow arrow, Fig 14) to quicken to life an organized community. A practitioner must have an **organized community**, to walk alongside a community

in developing their ability to confidently act in their own power and advocate on their own behalf. -> A practitioner must have a **community** acting with **agency,** to reveal the information most critical for establishing preparedness and response solutions that will have **long-term impact**. Critical to the information flow of this process is the contributing role and core-work of the successful practitioner (as depicted by the yellow arrow) to draw out communities' self-knowledge and present it back in a way that brings about the agency and long-term resilience of communities.

While our findings may echo much of what RCRC has categorized as community engagement, these findings come from a wide variety of projects ranging from shelter and health projects to in-school programs and first aid training; from refugee camp programs and event response operations to disaster risk reduction (DRR) and response team building. Further, they reveal a much broader as well as comprehensive "knowing" of successful practitioners. While it was clear that there is much important and helpful technical sectoral knowledge in use by practitioners, the realities of current information needs are that there is less desire for improved technical knowledge or technological capacity, compared with that for community knowledge and ways to help communities reach it. Practitioners' made it evident that having the information needed for success more heavily depends upon the approaches, dynamics, and factors listed here over any particular technical or technological solutions. This does not mean technical information does not play a role in success, rather, it means its role emerged as less significant to practitioners in this study than other factors for achieving success.

Fig. 14. Success Factors and the Information-Driven Behaviors of Must-Have I – Community Trust

A. Must-Have I - Community Trust

Being trustworthy emerged as the primary and foundational service of RCRC to communities and stakeholders—the number one must-have for practitioner's success and ability to access information. Community Trust is the basis upon which all other success factors depend and relates to behaviors rooted in knowing the community and being known. For successful practitioners across countries, having the community's trust was prioritized above all other efforts.

We found three leading success factors associated with having community trust:

1) Practitioners are implicitly and explicitly attentive to **rapport-building** with communities from the beginning, entering a community via the respected avenues with total transparency, spending time to become part of the community, and speaking with cultural competency.
2) Practitioners reflect **sincere care** for communities-–operating in a way where it was clear to all stakeholders that the practitioner's central motivation was to care for people's individual needs, and without further agenda—both personally and organizationally.
3) Practitioners foster **mutuality**—a central dynamic of trusted relationships among participants that embodies shared authority and mutual sense of belonging derived from participatory processes, clarity in roles and responsibilities, and commitment to keeping promises.

1. Success Factor 1. Rapport Building

Rapport building refers to the actions that practitioners took to become an accepted and trusted part of the community and nurture belonging. Successful RCRC workers emphasized that without knowing the community and being known, trust could not be established. Knowing the community meant that the practitioner took time to build relationships and learn the unique values, qualities, respected structures, and make-up of the community by spending time with them. Being known meant being present and highly transparent about who they are, the RCRC principles, their processes, and intentions. In most countries this was practiced by individual

practitioners—in one country, it was formalized into program design. Here, we reflect on the three critical ways that practitioners achieved successful rapport-building: **following the respected community structure, spending time within communities,** and **speaking with cultural competency.**

a) IDB 1. Follow Community Structures

From the beginning, successful practitioners are hyper-aware of building positive rapport by honoring and respecting the recognized decision-making authorities of communities while being explicit and transparent about their motives and objectives. RCRC project success relied upon good relationships within these community structures in order to be credible and trustworthy.

Honoring the respected community structures is closely related to transparency—about RCRC's intentions, activities, contributions, and processes. Successful practitioners were highly aware of and attentive to their relationships with individuals as they enter a community and determine with whom and how they interact, recognizing a critical need to follow respected community structures with complete transparency:

P87[48]*: "If they are suspicious they can choose someone to go with you; the chief can decide to choose someone to go with you. And then, you don't oppose because you know* ***you don't have any secret*** *like that to hide from them."*

[48] P = Participant, followed by an assigned number. Each number represents an anonymous participant interviewee.

Transparency is one key way of embodying the Fundamental Principles of RCRC Movement[49] into their work as they engage in the 11 success factors. Behavior reflecting **RCRC's fundamental principles** is essential to establishing credibility for the practitioner and the organization. More than any other behavior, trust of the community is particularly linked to the community's perception of practitioners' motivations. Successful practitioners practiced an intentional honesty and clarity about what the RCRC principles were, what could be expected of RCRC practitioners in a very detailed way, and what would be required of the government and community for their involvement. Practitioners then were careful to follow through:

*P112: "We do not violate **our fundamental principles**… and so that helps us because people know that our principles say we are neutral, we are not aligned to a political party… **we remain transparent** in whatever we do and so more than likely they'll look forward for us to provide the service."*

By incorporating practices that provide clarity in their intentions and mission, including their alignment with RCRC principles, practitioners communicate honor to the respected community structures and create trust and belonging with communities. In this way of operating, local authorities could trust that RCRC did not seek to work against them. This, in turn, also meant the community could trust that working with them would not create conflict with the larger community. Finally, it is the community structures, as we will see with success factor 5, Strengthening the Social Fabric, which later becomes a necessary pathway for which RCRC and the community are able to strengthen and sustain their preparedness impact.

[49] Humanity, Partiality, Neutrality, Independence, Voluntary Service, Unity, Universality

b) IDB 2. Spend Time with the Community

Trustworthy relationships with community members are developed and nurtured through spending time together, including activities outside of traditional job tasks. Rapport building, or becoming a belonging member of the community, was predominantly enacted through directly living within the communities or engaging in repeated, frequent visits. There appeared to be no shortcut for time with, and presence within, community.

Practitioners expressed sharing a one-to-one value system that was aligned with the communities' needs: *"We are 100% on the community side."* Practitioners who are part of the community have goals and agendas that not only align with but are *driven by* those of the community, which explains the importance of drawing out information from the community. Practitioners' ability to understand, adapt, and respond to community needs is achieved by spending time with the community.

Successful practitioners demonstrated an unquestioning willingness to go above and beyond in their personal time to gain this important time with communities. Practitioners described visiting communities on weekends, staying longer than required when visiting communities during the week, attending weddings and funerals, and engaging in social activities such as soccer games with community members. It is the deep connections formed with communities that allow for the free-flow of communication that will ultimately inform success. This free-flow of communication is also a key for successful response—when information flow needs to happen quickly:

P64: "It is effective because this is a community where you are living... Once you are in your community, you are used to the community, and they are also used to you, ***and it is easier to get***

information *–so first I call them and they know that the contact person who can help you so fast."*

P117: "Now, for all the communities that RC has live-ins -- I have all the contact information…sometimes cell phones are still up [after a disaster] and once that happens, ***they just call the information in****. And we do it by clusters… They'll call and say well, we have flooding. They normally just call. And I said to them, call. If you don't get me, call back. If you can't call and get me, just put the community name..."*

House-to-house visits, in particular, where these deep connections begin and emerged as a critical staple in every context for practitioners. Theses spaces give practitioners the needed time for engaging and supporting the community members in a way which builds genuine relationships and understanding:

P36: "When we go to poor people's houses with our RC uniforms, they share a cup of coffee. It is just a simple cup, but it means a lot to them. That is the moment in which we realize that ***we have access to their houses, and we understand each other.****"*

P114 "…when you sit down, ***when you can go in somebody's house*** *and sit down with them and you can talk they will develop this confidence. And they can tell you what it is that is causing them to hurt or what is it they are feeling and why is it they can't send their children to school and what it is that is bothering them."*

Hence, the intimate space and one-on-one interaction of house-to-house visits are necessary for building trust. And because the interactions needed for establishing strong connections begin in house-to house, these visits are a crucial space for practitioners to create a free-flowing

communication. This space then becomes a key location for determining effectiveness and understanding how to adequately adapt and problem solve with communities, as expressed by one practitioner running a preparedness education program in schools:

Q: Ok, in terms of this project what are the components that make it successful?

P39: First the deep approach to the community

Q: What does that mean?

P39: That we are not only going to observe them, but when we identified them we try to approach their families, their houses by visiting them to see what's happening beyond the school.

Q: This project is in schools but they even go to the family's home?

P39: After the first visit ***we do follow up visits to see the changes*** *of the kids. For example in healthy hygienist habits, we observe how their habits improved; if the house is cleaner...*

Being present and spending time are necessary for becoming trustworthy, understanding needs and assessing progress, but they also serve as an important place for becoming cultural competent.

c) IDB 3. Speak with Cultural Competency

Another way practitioners build rapport as they spend time with communities, is by immersing themselves in relationships, culture, and ways of life of the communities where they worked to become part of the community. Specifically, practitioners practice an intentional sensitivity to the way they speak, respecting the unique qualities and makeup of the community. In fact, speaking with cultural competency was often explicitly taught to volunteers. As practitioners learn the community's cultures, norms, values and sensitivities, successful

practitioners adapt their behavior, language, and approaches to the community. In-turn, they increase their own understanding and effectiveness through the way they communicate.

Practitioners aim to be seen as peers in rank, and they enact that equity by demonstrating dignity, honesty, patience and respect for community members and by playing the roles of their peer rank with competency. Participating practitioners revealed how this respect is centrally conveyed through communication: listening carefully to community members and communicating in ways that show cultural competence. Several practitioners said that *how* they approach people is as important to success, as what they say:

*P91: "**[Success] is about the technique we use to approach people**, you know, when you have to deal with people, you need to be honest, you need to be a responsible person, respectful, and to know that the people that you are going to meet are people who are different from you. So you need to accept them, listen to them, be patient, all of these."*

Language, in particular (for example, in terms of tone, form, word choice) provides key messages about the practitioner's view of rank and power to those they interact with, an issue that informed the training of volunteers:

*P42: "How do I explain this? It is about **how to approach people**, since the time you say hello, to know how to listen to them, a very careful approach to the families. It is also important to mention training that volunteers receive because we don't start with zero. They have previous training. **The language is also very important**. We don't use a very technical language. So it is not like we are the professionals and they are the community, but it is **a peer-to-peer approach**."*

In other words, showing respect for community members includes both an *expectation* of cultural difference and care to accommodate that cultural difference through the way one interacts in communities. As seen here, becoming part of the community through rapport building is an important time-space for learning how to speak, what individuals value, understanding their basic needs, and how best to meet those. In addition, it is within these individual interactions where the next foundational success factor for earning the trust of the community is substantiated—that of sincere care.

2. Success Factor 2. Sincere Care

Practitioners credit having a sincere motivation to care for people and communities as a primary reason for their success. Practitioners sincerely believed their motivations, and the community's perceptions of their motivations were a primary reason for their success. A practitioner's motivations, and hence RCRC's work, are well-received when individual interactions communicate a **motivation rooted in sincere care**, or what practitioners often called "love," for community. Sincere care was expressed when operating in ways that made it clear to all stakeholders that his or her central motivation is to care for people's individual needs, and without further agenda—either personally or organizationally. **Meeting needs individually and holistically**, and a high degree of **responsiveness and follow-up** are primary common behaviors that practitioners enacted to communicate this sincerity.

a) IDB 4. Motivation Rooted in Love for Community

Practitioners we observed sincerely expressed a great deal of affection for the communities they worked with, and often used the word "**love**" to explain the heartfelt motivation they consistently credited for their success:

P41: "*I don't think there is any secret [to success] I just love people and to make them happy—so what I did I would come here and stay the night and be here and sleep and be here all the time and just to make people happy."*

P29: "*The first [thing you need for success] is the love for our job. The second one is the love for our communities and the love for people who needs us*"

P40: "Well, actually [most important thing is] to work with love, to WANT to do things with the community. Sometimes you not only have to have respect for people but a sense of belonging toward them as well. In this work, one is not working alone but with the help of others. That leads to the work I do, to be successful, succeed."

A constant regard to nurture the sense of belonging and equity with communities reflects the implicit value born out of this deep motivation and the genuine relationships built between communities and practitioners. In one country, the importance of this motivation in their personnel was reflected particular behaviors had been implicitly incorporated into human resources interviews and then training. One practitioner explained when he was hired, it was emphasized that "there is no room for anger with local community members in the RC." He was instructed, that while with contractors or government officials it might happen, losing one's temper with the community could not be tolerated.

The statements above express how practitioners attributed success to acting from an authentic place of loving and caring for one another, and implicitly holding this criteria as a requirement for anyone doing their work. Without it, successful practitioners did not believe they, nor other RCRC workers could have the motivation needed to perform adequately:

P53: "For example if we have a disaster situation we need to go there whether it is day or night; be ready all the time. And if you do not love your team and the opportunity to go whenever you should, you will not go anywhere and will not enjoy your job. "

P49: "The success of our work depends on the team. There is mutual understanding and respect. Sometimes we help each other, and in this way, reach our goals. This is important because we are an international humanitarian organization. It's the fact that we know that we have to help….it is a person's character, a moral issue. We work with precious people. We try our best to find the ways and approaches that suit the group. We know that we need to help if people need it. We need to extend a hand and help…sometimes [we have to do] all sorts of jobs. Not even the one in the job description. We go beyond these descriptions. "

Pay interacted heavily with this perceived perception of genuineness with communities and with teammates. Many participants expressed working with little pay or no pay as central to demonstrating the sincerity of their motivation and the RCRC principle of volunteer service, and therefore, trustworthiness and reliability.

Organizationally, the lack of financial incentives supported the perspective—both internally, as a core value amongst the team, and externally, with communities—of RCRC's reputation as being trustworthy. Practitioners often credited their success to an "advantage" they held over other NGOs of having credibility with communities. A re-emerging aspect of this credibility was the way that RCRC workers attested to receiving no pay or much less pay as a witness to the sincerity of their motivations. It provides one of the few tangible ways communities assess a practitioner's, or organization's, motivations to be genuinely rooted in care for the community.

b) IDB 5. Meet Needs: Individually & Holistically

Meeting needs is the openly stated core work of RCRC societies. Therefore, meeting needs necessarily is a basic requirement for success. However, practitioners also most evidentially demonstrate sincere care to communities by when they meet the community's specific individual and holistic needs. Successful practitioners shared a common focus to care for the individuals they serve while continually advocating for a holistic approach.

RCRC practitioners recognize meeting individual needs as their obligation and will go above and beyond to do so, regardless of organizational obstacles. Instances of adapting down to the individual level of need was evident in every context, and often given as the chosen example to represent successful work. Although not organizationally mandated, we found it routinely practiced in community interactions. For example, teachers would adjust the content of their training plans to meet gaps in knowledge or volunteers would work around the rules to feed a family for one more month past was permitted, and even pay out of pocket to feed someone a meal or pay a bill. One group gave the example of altering the approved architecture plan for a woman with a special eye condition where her vision became impeded by bright light. They removed windows from the plan, and in addition painted a picture of a window on the outside of the house. The included justification of success across these examples was that they somehow confirmed sincerity of motives—that attention down to the individual is proof of the genuine care of the RCRC.

Meeting individual needs goes hand in hand with successful practitioners use of holistic approaches. A holistic approach enables a necessary flexibility for tailoring their programmatic actions to help meet specific needs. Practitioners often seek ways to meet a wide range of needs

within communities, regardless of technical sector. This is important not only for adaption to individual needs, but also for addressing root causes. This approach is a unique characteristic afforded preparedness practitioners, who start the process of identifying needs not tied to any particular technical sector, but by starting with community-driven risk assessments. It allows the community's more urgent needs to emerge, uncovering root issues so that more relevant and effective actions can be taken:

P42: "The project that was developed was changed according to the context. It depended on the dynamic and the characteristics of the area, and the needs of the people. It was initially about sanitary units, but when we went into the community we realize that there were other needs. We found that many families were living in small spaces so we realized that there was a need for another room. That means building the room, materials. We realized that for health reasons, we had to provide better stoves."

Being able to meet the most immediate needs regardless of sectoral priority is also crucial to building trust, and allowing the community-driven prioritization of interconnected needs. Once immediate needs are met, then individuals and communities are able to realize their other long-term needs. For example, practitioners who wished to bring earthquake preparedness to communities, emphasized that they could not talk about the earthquake risk, until the more urgent risks to the community were addressed. If the community was hungry for a meal tomorrow, they would not be ready to engage on a risk that they could not as easily predict.

c) IDB 6. Responsiveness & Follow-Up

In all countries, sincere care was notably expressed through responsiveness and follow-up. Initiative in communication—combined with being present, spending time—demonstrates a practitioner's accessibility, reliability and ultimately trustworthiness to communities.

We saw this in practice as we joined practitioners at work, making and taking calls, visiting community members, giving out their number, making lists for actions, multitasking, and juggling many tasks at once to keep things moving along. Community members remarked how they can always reach their volunteers; volunteers their aims to follow-up on every request even if they couldn't meet the need, they would pass along information to someone (other service providers or neighbors) who could; and project officers at HQ spoke of their intentional efforts to check in every few days with all of their branch officers:

P44: "I try to call them as often I can. All of us have Skype, and we just like [ask] "how are you doing, hello, everything is fine? How is going? How is training going or did you receive money for this training? Did you prepared everything?" Very simple things can make the person really happy."

Practitioners also implicitly recognized these skills as important as they told us when they recruit volunteers or valued team members or shared examples of strong practitioners they used terms such as "busy," "active," "reliable," "motivated," and "loyal" to explain the characteristics of their best performers.

Follow-up is a key way successful practitioners represent to others that their word is reliable: that they can be counted on to do what they said they would do: to help. Following–up on smaller requests, like returning a phone call or accompanying someone to go to the hospital

are important ways successful practitioners could demonstrate their reliability. Successful practitioners combine long-term projects with less funding-intense efforts, such as partnering with service providers to provide opportunities in response to families concerned about their health or community frustrations, like organizing exercise groups, community clean-ups, or educational events. Delivering in these short-term projects were important for not losing trust when bigger projects took a longer time to show results. They reaffirmed RCRC's credibility by showing short-term results and maintaining the trust needed to wait for longer-term results.

Follow-up, in particular, also enables more opportunities for responsiveness. It is a key way for practitioners to be aware of changing needs and to engage in ongoing learning. As we noted in information-driven behaviors #2 Spend Time, and #5 Meet Needs, practitioners value this time for precisely the purpose of being responsive to individual needs, and the feedback it provides them on the success of their work, or needed adjustments to ongoing projects:

P89: "One day we were making a shelter and one of the woman came to tell us that a the way that we put the mat was not appropriate to their rules… not good for their customs. But we take it account and we put it where she wanted because it's her shelter."

If practitioners are present over time, they will know what is working and what is not working, and can respond to the expected dynamic of ever changing needs.

3. Success Factor 3. Mutuality

Successful practitioners valued mutually beneficial exchanges between the RCRC and community members and across community stakeholders. Mutuality is a third success factor operating when trust was present. Without the two-way street of mutuality, a shared exchange of

valued information cannot be maintained. Mutuality was expressed as a **shared authority** among parties and characterized by a sense of mutual belonging, ownership and accountability. It is carved from participatory approaches and working to **create clarity of roles and responsibilities** with written, agreed upon specifics for ways of operating among stakeholders. It is sustained by RCRC practitioners in their commitment to **keeping their promises**.

a) IDB 7. Mutual Authority

Mutual authority describes the relational acknowledgement that all are receiving, all are contributing, and all belong; and therefore, all may hold one another accountable to what has been agreed upon, no matter what traditional hierarchies or perceptions of power might be otherwise recognized. This relational acknowledgement could be seen in the way successful practitioners enable a dynamic of mutuality through participatory approaches that include face-to-face meetings.

Where community members possessed a legitimate sense of authority, individuals feel comfortable to speak up. We observed a good example of this in action when a slightly impertinent visitor from a branch office was speaking to a group of community volunteers. When one volunteer arrived after the meeting had begun, the speaker lightly drew attention to this. However, the community member did not receive the chiding willingly, and responded with a correction that he was not late but, in fact, the speaker had moved up the meeting at the last minute and began early. As this was the case, the speaker, in turn, humbly acquiesced.

In development and humanitarian work, it is common to think of donors, aid agencies, and those with funding as "giving" parties and communities receiving aid as the "receiving"

parties. However, in areas where practitioners were successful, there exists acknowledgement of mutual contribution and benefit among parties:

P38: "First, they were called, the target population of our intervention. With which we completely disagreed, because we said that they are not passive, rather they put a lot in play in order to bear fruit. The other thing we want to change is the concept of beneficiary, since they are there not only to receive, but they are making a significant contribution to the process also. Also, because on the logic of the beneficiary, often people perceive the other as if they were a little below us, they are less than us; but they do not realize that we are receiving and learning a lot from people, too."

In their own quest to attain information critical to successful projects, successful practitioners acknowledge they are receiving many benefits in being accepted as member of the community including being given access to community culture, knowledge and understanding--information that is only shared among it's members. Without trust and belonging, RCRC cannot receive open access to what the community cares about—which is what the practitioner needs for project success. The successful practitioner's expressed regard for belonging as previously introduced in Rapport Building (SF1) is mutual; and represents both an acknowledgement of the practitioner as an equal "beneficiary" of something of great value (community trust and information), and of the community as an equal "donor" within the project. Successful practitioners acknowledge the community's legitimate ownership role within a project, the decisions and even, the continued relationship.

Participation is an expression of one's sense of belonging and ownership. A community's sense of authority is born out of a willingness to participate, which sprouts from a

trusted relationship with a practitioner who champions mutual belonging and authority through a commitment to participation:

P72: *"One of the contributing factors I would think has been our constant engagement with the communities. We have managed to gain community trust as the RC, you know? We are always there when a disaster happens, and we've also initiated what we call beneficiary accountability. Previously, we'd only account to those who give us the funds and we'd ignore those we seek to serve, you know? But now [there is] the fact that we engage the communities themselves to identify the areas of project implementation. And it was a very intense, it was a very intense exercise."*

Because participation houses the seeds for mutual authority, successful practitioners often pointed to community participation as an indicator for success. Where practitioners were successful, community members participated in problem identification, solution-finding, decision-making, implementation and evaluations during RCRC projects. We observed that trusted practitioners' preferred methods that enhanced this participation, showing stronger preferences for tools and processes specifically based on their ability to foster or deter a sense of belonging and ownership. For example, they pointed to the main advantage of face-to-face meetings and the importance of presence in terms of making participation and belonging more accessible. Their rejection of seemingly helpful technological tools, at times, such as smartphones and excel spreadsheets, is linked to disruption to mutual presence and authority they can introduce. One practitioner specifically explained, that although he and his teammates owned iPhones and agreed they would be helpful in some tasks, they preferred not to use them due to the way it violated a sense of mutual belonging and would therefore prohibit participation.

We discuss tools further in the next success factor, Pedagogy for Empowerment (SF4). Mutual authority lays the groundwork for the practitioner to begin to facilitate a mutual agreement of roles and responsibilities, and ultimately achieving the future must-haves of community agency and long-term impact.

b) IDB 8. Create Clarity of Roles

The next critical building block to the success of achieving mutuality is the importance of clarifying roles and responsibilities for volunteers, team members and all stakeholders in a project. In clarifying roles, successful practitioners facilitate the explicit defining of each party's responsibilities—responsibilities that are mutually agreed upon by individual team members.

P65*: "It is all about knowing your role and accept it and division of labor…. another factor is the involvement and participation of all stakeholders, of sharing the responsibilities across [stakeholders] has been a critical issue."*

We observed team and community meetings where practitioners facilitated agreement by leading the whole group, line by line, through written documents intended to express clear and mutual agreement. For example, practitioners described using the Vulnerability and Capacity Assessment (VCA) tool to develop action plans that were very detailed, including each step involved in, example such as building a water tank--with an entry for each step designating who is responsible. Also, when building a response team, or when the community, partners, government and the RCRC conduct preparedness planning together, all participants will openly review together the word for word obligation of each.

Clarification of roles is a highly detailed process of not only sharing responsibilities across stakeholder groups but of mutually deciding upon and creating a record of who is doing

what. Developing records and reports provide a mutual clarity needed for carrying projects forward over the long term. These written records particularly when created in the presence of all stakeholder groups and often signed by them, can then be consulted at a later time to hold parties mutually accountable. This is an arduous and time-consuming process of collaboratively developing written agreements directed by the community's priorities, requiring a great deal of time, patience and administrative initiative by practitioners. In addition to having a great deal of responsiveness and follow-up in creating and editing these documents as agreed upon, practitioners also demonstrate considerable organization skills and attention to detail.

In a diversity of successful work, we found such collaboration processes captured in written agreements undergirding the success of projects, and key tools used by practitioners and communities to motivate, build capacity, and leverage resources, as well as hold stakeholders accountable. This work in creating clarity brings a mutually empowered sense of accountability to teams and communities, as well as for organizing communities to establish their own voice and use it.

c) IDB 9. Keep Promises

Finally, trust built through mutuality could be negatively affected by RCRC practitioners making promises that are not kept. Successful practitioners are acutely aware of the halting impact unkept promises can have on their ability to succeed. They are extremely careful to manage and balance their desire to help with the prospect of making broken promises.

P52: "*As I already said before, we speak with people in their language, we are closer to them. They accept us as their own, they know that we will not leave them like other organizations and we keep our promises."*

P30: "The community cannot be cheated. You cannot just talk—blah blah. If you work directly with the community, and you do what you promised, then you will have a lifelong defender. And that is very important for the RC because in the end its purpose is to support vulnerable communities affected by disasters."

Successful practitioners are intentional not to jeopardize trust by committing more than could they know can be provided. If they are not confident of their organization's ability to deliver for a particular project, they were careful not to promise, recognizing a single failure to deliver would result in loss of the community's trust. This was a primary pain-point for practitioners—where projections are made based on expected resources from headquarters or donors but are met with delays in funds or logistics. The inability to guarantee their performance emerged as an occasional obstacle to the adoption of technology, as well. For example, one practitioner responsible for finances explained a long and difficult trip he would take every few weeks in order the to collect the financial paperwork and original receipts from a team in a far-off village. When asked about the option of using a scanner, he rejected the option for the uncertainties it would cause in his ability to guarantee delivery of the receipts to him. Successful practitioners are apt to choose the most reliable methods to maintain their ability to make good on promises.

In cases where things outside of their control impinge on promises that have been made, practitioners would engage in bargaining with communities and providers for time and trust in furious attempts to not lose more trust and to deliver on the mutual accountability they owe to the community. In bargaining, practitioners draw from a precious bank of earned trust that could not withstand too many shocks. Therefore, not keeping one's word is something to which

practitioners are especially alert for its effect of eroding trust. The perceived authenticity of the practitioner and, in turn, of the RCRC is at stake, and difficult to recover once lost.

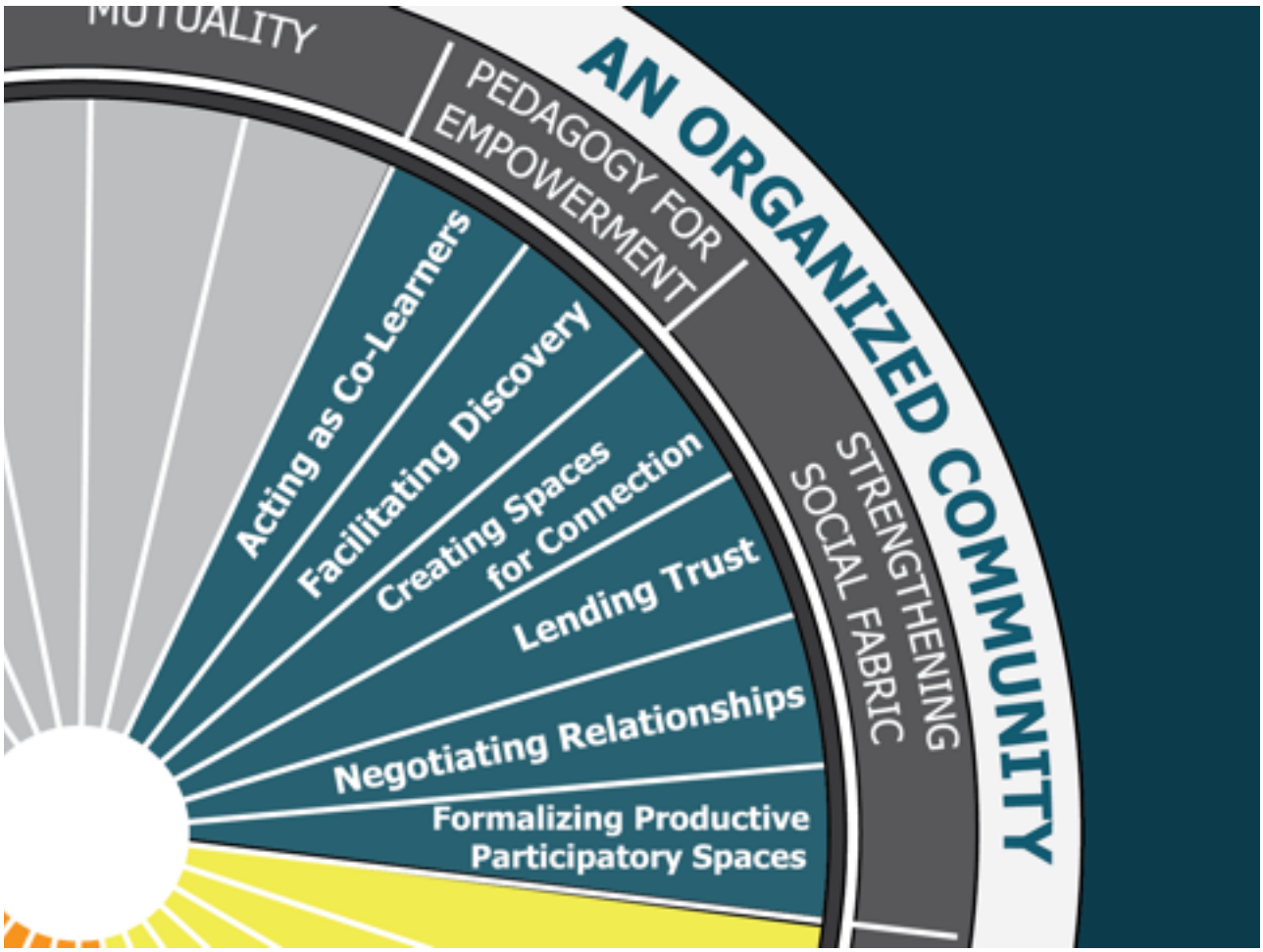

Fig. 15. Success Factors and the Information-Driven Behaviors of Must-Have II – Organized Community

B. Must-Have 2 - An Organized Community

The information that practitioners most need for successful work is at the intersection of community knowledge, experiences and beliefs. However, communities are rarely singular entities and are composed of diverse—sometimes conflicting—groups, peoples, agendas and even cultures. Therefore, advancing from a strong foundation of trust, practitioners next seek to foster an

organized community, nurturing the awareness and connection needed for community-wide discourse and decision-making. An organized community paves the way for community agency and, ultimately, for successful preparedness and response. Therefore, successful practitioners are embracing the necessary task of strengthening or cultivating community organization: where a community's organization is strong, they seek to further strengthen it, and where organization is weak, they use advanced skills to help communities develop it. The practitioner assumes this role precisely because he or she has been welcomed as a trusted part of the community.

This section summarizes the advanced skills practitioners are using to foster an organized—i.e., aware and connected—community, and it reflects some of the most impactful implications for meeting practitioners' information needs in preparedness and response work. We group this must-have into two underlying success factors:

- Practitioners facilitate community awareness through sophisticated **pedagogies for empowerment**, situating themselves as co-learners within the community and practicing reflective and interactive teaching methods to facilitate communities in self-discovery.
- Practitioners foster connection by **strengthening the social fabric**—that is, reinforcing relational bonds by lending their trust across community groups, creating space for connection, applying conflict resolution experience to navigate relationship, and then moving to formalize this trusted space for the long term.

1. Success Factor 4. Pedagogies of Empowerment

An organized community is an aware community, where neighbors (1) know one another and their shared history; (2) establish networks and mechanisms for reaching each other, sharing

information, and allowing discussion on matters that affect preparedness and response; and (3) learn and decide together. We found practitioners' use of pedagogies of empowerment—sophisticated teaching methods that involve listening, reflection, and dialogue to lead the process and outcomes of learning[50]—as a common factor across practitioners that led to successful community realization of their own knowledge and power (i.e. community agency).

The yellow arrow depicted in within this flow (figure 16) represents skilled use of pedagogy and facilitation of dialogue by successful practitioners to help communities draw out existing knowledge, capacities and power that already resides within them, individually and collectively, and reflect it back to them for their own realization and action.

Fig. 16. The successful practitioner activates ommunity agency through skilled use of pedagogy and facilitation of dialogue

This success factor is grounded in an attitude in which the practitioner situates her or himself as a **co-learner** among the community. From this position, practitioners can contribute

[50] Practices of successful practitioners reflect specific adult education pedagogical theories such as "transformative learning theory," "position identity," and "critical reflection." eg: Mezirow, J. (1990). How critical reflection triggers transformative learning. *Fostering critical reflection in adulthood*, 1-20

reflective and interactive (dialogical[51]) methods for **facilitating positive discovery** of one's own abilities and capacities as well as those of their neighbors. In this phase, successful practitioners provide an essential role and service, helping communities to draw out that information that resides within the community members, themselves, and is most needed for their successful resilience to disasters.

a) IDB 10. Act as Co-learners

Pedagogy of empowerment, a term used within academic communities, reflects a style of teaching that embraces a co-learning approach to teaching. Successful practitioners echoing methods akin to this appreciate that the most important knowledge needed by both the practitioner and the community is that which resides within the community itself: people's experiences, history, beliefs, capacities and solutions. It involves an attitude that recognizes the authority of community members, and practitioners situating themselves as co-learners amongst the community:

*P46: "It's another style of management. For us, it's like **democratic**. For example, if a branch volunteer or even like interns says to me, "It will be correct and it will be useful." Why not? **We, [practitioners], don't have a right position** or wrong position. We discuss everything."*

Comments like this reflect the common guiding mantra practitioners shared across these success stories—that of *"the community knows best."* This perspective includes recognizing that

[51] characterized by a mutual dialogue; discussed further in information-driven behavior #11 – Facilitating Discovery.

communities are in the best position not only to lead in developing effective solutions but also in defining what the problems are:

P33: "If they live close to river, ***they know exactly when the river comes****, when the river overflows****. They know how to live****. What is important—it is to know what people really want,* ***to know what they really feel about the risk they have****, because sometimes we think they have a risk but for them is not a risk, it is their daily way of living."*

Equally important, by situating themselves as co-learners, practitioners show a humble recognition that there are hidden things about the community they cannot know, thereby making space for critical information to be revealed.

This recognition of community knowledge and authority does not mean the practitioner does not contribute. On the contrary, having taken the necessary time to establish themselves as members of the community, practitioners are enabled to play a respected role in the discussion, providing valuable information in areas such as disaster preparedness or sectoral technical expertise. Yet, more than this specialized knowledge, these practitioners saw the role of helping communities to access their own knowledge and capacity as far more critical:

P34: "Through the guidance of the RCRC—and not only RCRC technical knowledge---there is a lot of knowledge, a lot of information that the communities have. Communities know a lot of things but they don't have the ***incentive and the guidance*** *[to decide and act for themselves]. For example, the government goes and gives what they consider has to be given may not be what the community really needs, because they don't do a* ***participative action with the community****."*

Having positioned themselves in supporting and discovery roles, practitioners have an increased awareness of the central importance of listening. RCRC practitioners are alert to the expertise of community members and invite those community members to share expertise with both their fellow community members and with practitioners. When talking about what information they needed to successfully access to do their jobs well, practitioners talked a great deal about the importance of listening and their use of—and desire for more training in—group facilitation skills.

b) IDB 11. Facilitate Discovery

Across societies, the vulnerabilities and capacities assessment (VCA) methodology, response team training and disaster planning meetings were frequently named in the context of success.[52] In particular, these tools were valued by successful practitioners for their role in helping to draw out what the community knows, and supporting community reflection and interaction.

*P95: "VCA is just a tool from which we can derive the problems of a community. It is the **realization of the problems by a community**, which is probably the main reason that the project is successfully running til now."*

However, the practitioner's ability to wield these tools by offering keen insights, navigating conversations, and encouraging reflection in a way that fosters community realization ultimately realizes the tool effectiveness (or not). Practitioners inspire positive learning, self-discovery, and discovery of others by nurturing and encouraging intra-community dialogue. By

[52] Participatory hygiene and sanitation transformation (PHAST) was also named more than once.

observing and accompanying the community in bringing forward its own ideas, understandings, and beliefs, practitioners foster the conditions that leads to longer-term goals being pursued **by the community**, not pushed by the practitioner.

Dialogical methods[53] in education describe an interactive process when all participants, through the act of reflective and non-power-based conversations, are allowed to contribute knowledge to a dialogue, so that meaning and understanding is constructed collaboratively. Many practitioners have learned along the way, or even designed themselves, such interactive (as opposed to authoritative) activities that value reflection (as opposed to direction). Dialogical learning allows participants to lead the conversation and express their highly situated understandings such that the varied meanings, motivations and purposes they each bring, and the tensions between those variations, are allowed to determine the outcome.

P42: "*Let's see. Well, I started with some exercises through a game. We made teams, and we built some platforms, and we had to accomplish a goal. So how would the team accomplish the goal? They have the platforms, and they have the rules of the game; so this makes people smile and laugh, and at the end I ask them what they have learned from that. What does the team have to do to accomplish the goal? What does* ***working together and listening to each other*** *has to do with it? So with that type of dynamics, I can* ***talk about the project with the people****. We accomplish to get this, and I tell them that it is important to listen to each other and it is also important to have a leadership. So I bring this idea to the project. To execute the project we also*

[53] Shor, I., & Freire, P. (1987). What is the "dialogical method" of teaching? *Journal of Education, 169* (3), 11-31.

need work teams that can organize themselves. Also talk about motivation and to generate the commitment of the people. I designed these things."

This is the cherished moment for which the practitioner has invested so much—releasing the practitioner to shepherd the community through collective sense-making and enabling the community to discover their most viable solutions.

Another key area of discovery and learning recognized in the VCA, but also by practitioners not using the VCA, is in regard to capacity. Successful practitioners are heavily concentrated on the importance of leading community members to recognize their own capacities:

P34: "*When we start this identification of capacities, the transformation of the vulnerabilities into capacities is key.* ***We look at people's own capacity****: 'Hey, you have guys who run so fast. Did you see that before? So he can be the early warning assistance while we find money for other early warning assistance'****… This is the key moment****."*

P77: "*It is through questionnaires that we determine, that we define: For example, we can ask, "Is there an economic unit in your area? Are there churches? Are there stores, is there a market?" And we can know for example that when there is a flood in the village, if there is a school in the village, it can serve as a capacity of shelter for the victims.* ***Because sometimes our communities have capacities but don't know they do****. They think it doesn't represent anything important for them."*

Successful practitioners pinpoint recognizing capacity as a critical pre-cursor for communities to realize their ability to act on their own behalf. While not all inclusive, other effective methods at play reflecting pedagogies of empowerment and dialogical learning included:

+ Hazard mapping of historical disaster events (interactive and collective reflection)
+ Role playing, theater dramas, and dance for expressing reflective learning
+ Games and practicing with a discussion component

In facilitating discovery, practitioners accompany the community in bringing forward its own ideas, understandings, and beliefs through reflection, dialogue, listening, and learning. These impressive pedagogical skills practiced by successful RCRC workers hold a symbiotic relationship with the skills discussed in the next section, to help create the robust environment needed for achieving must-have III, community agency.

2. Success Factor 5. Strengthening Social Fabric

An organized community is also a connected community. Pedagogies of Empowerment (SF4) explained ways practitioners facilitate an aware community and strengthening social fabric explains ways practitioners facilitate a connected community. A connected community is one that has developed trusting spaces for gathering and has established agreed-upon ways for working and acting together toward shared priorities, in spite of differences.

Where there are existing structures in place for connecting the community, practitioners can achieve greater success in preparedness work. Where there are not trusted places for shared discourse among the diverse members of the community, successful practitioners emphasize fostering connection, or strengthening social fabric**,** as necessary work.

Practitioners first strengthen the social fabric of communities by **lending** their **trust** among individuals and groups, thereby **creating a** temporal **space for connection.** Next, they **negotiate relationship** employing group facilitation skills and conflict resolution techniques. Finally, they move communities to **formalize** this **trusted space** for the long-term.

a) IDB 12. Lend Your Trust

Many successful practitioners view their role in building trust connections among individuals, disparate groups, and institutions not only as a necessary step for a community to have agency and resilience, but specifically, as one of the core services RCRC offers communities:

> *P34: "The community doesn't believe in the government all the time, and the government is doing a good work. But **this link between the government and the community is the real challenge** for us, because we go out [for a short while] but we are not with them forever. So how the community can improve their own skills to go and advocate with the government? I think when we talk about this coordination between community, institutions and government; we are talking about **this link, this commitment, this will, between all of them.**"*

To build connections, the RCRC practitioner must have earned trust not only within the community, but also with the government and other stakeholders. As discussed in Rapport Building (SF1), much of a practitioner's core work is in building authentic relationships with the community and other stakeholders. Here, we see yet another place where a foundation of trust is necessary—practitioners who have successfully built trust are able to "lend" or share that trust to enable communication among stakeholders. Once achieved, RCRC's credibility serves to create a space of willingness and trust among other parties, be that community member to community

member or between communities and authorities. For example, although the community may not trust the government and vice versa, where they both held trust for RCRC, the stakeholders can depend on the trust of the RCRC until their own is developed.

b) IDB 13. Create Space for Connection

In enacting this success factor, practitioners organize and design space for building bonds among multiple diverse community stakeholders, and also among diverse community members. Meeting each other in coordination meetings and trainings hosted by RCRC creates a temporal space where these parties can safely meet together, and have the mediation of a trusted partner.

> *P73: "They elect their own members, people within the community,* ***different groups, different people, men, women, people with disabilities, the elderly****. And because they have lived in this area for so long, they know everything more than we do. So ours is to just sit with them, and we share knowledge and experience."*

New respectful and mutually beneficial relationships are built in this space, particularly through project meetings and exercises where personal interactions can occur between community/team members. Practitioners design space into projects to build and enhance bonds between community members:

> P42: *"So the exercise also included that a small group can organize itself to cook lunch for everyone, so* ***that also helps to integrate them more so they can know each other better.*** *Because even though they were from the same neighborhood, sometimes they didn't really know each other."*

The space also allows individuals with varying levels of comfort, and varying strengths to be embraced by the group for their contributions, and in result, flourish. Participants build trust and confidence both in a) their own capacity to serve others and b) in one another, as each other's positive capacities are revealed.

c) IDB 14. Navigating Relationships

While a practitioner's work may consist primarily of coordinating planning meetings, conducting training, and visiting communities, much more of the work resides in the hidden aspects of how they manage relationships within these shared spaces. Across contexts, successful practitioners share significant skills for cultivating an environment in which diversity and unique contributions of individuals are valued.

P84: *"Once you come here we all form one family. There is no discrimination. It doesn't matter what your ethnic group is. Whether you are a [tribe name 1], a [tribe name 2], a [tribe name 3], or whatever ethnic group, we form one family."*

By modeling respect and listening to all community members, practitioners foster an attitude of acceptance amidst diversity. An ability to mediate the diverse interests of participants, whether in neighborhood meetings, or among varied stakeholder groups, was a recurring theme. Navigating complex relationships became especially apparent and necessary for practitioners' engaging in multi-stakeholder projects, in particular. One practitioner provides insight into this implicit part of successful work:

P42 *"If the main interest is the organization and the community work, then really important in these kind of projects are the institutional articulation and the coordination. For example, we did a coordinated work with a local NGO, national government agency, the mayor's office, the*

community, and the RC, avoiding antagonisms. The RC convoked and programmed the drills and articulated the actions of all the entities. ***It was about mediation*** *between different organizations because every organization had results to show, and they want to be recognized.* ***So we mediate between the interests*** *of the organizations to avoid conflicts, so they could work together rather than in individual actions.*

We consistently found that practitioners who were named for success held conflict resolution training and skills. In each society we met participants relying on conflict resolution skills in which they, or others, credited for their success in preparedness programs. Practitioners had brought this skill set with them from other experiences, as expressed in these examples:

P96: *"There are fights/arguments in the village. Even though I was small/junior****, I saw my father, my grandfather*** *used to moderate such conflicts. I think I learnt from them and don't feel awkward in fulfilling such roles."*

P99:*"This is my formula for managing conflict, and I have been training my colleagues: 'Guys, if there are some conflicts in the community, it can be in many forms. It can be in the form of geography, it can be inform of socioeconomic structure. These things are there.' This is mostly designed to work in the conflict scenario* ***because I worked in a refugee program****, so I practiced it there, and this is my impression. I am trying to replicate."*

Conflict resolution training or experience equips practitioners to navigate the sensitivities of diverse stakeholders and to unite communities around a common purpose. This was regardless of a project's location in programmatically recognized conflict or non-conflict settings—exposing the need for such skills in any community.

d) IDB 15. Formalize Trusting Spaces

As practitioners find success in resolving conflicts and creating safe spaces for relationships to form within communities, they also are seeking ways to strengthen the social fabric by incorporating created places of temporal trust into established parts of the community structure.

In half of our country visits, while practitioners were working to evolve places of shared trust and mutual participation amongst participants, they were also endeavoring to sustain trusted spaces within the community system. In these cases, even in spaces where only a small amount of trust had been created for meeting and possibly planning or agreeing, practitioners were formalizing these opportunities through law:

P34 *"So we motivated them to be part of the governmental boards at local level. They have municipal councils of risk management;* ***these councils by law have to have community members****."*

At least three societies we visited had engaged and advocated at the national level for creation of new legislation to mandating such councils at the local level for addressing preparedness. These initiatives additionally brought more sustainable funding for response and preparedness initiatives funneled through federal government priorities and structures.

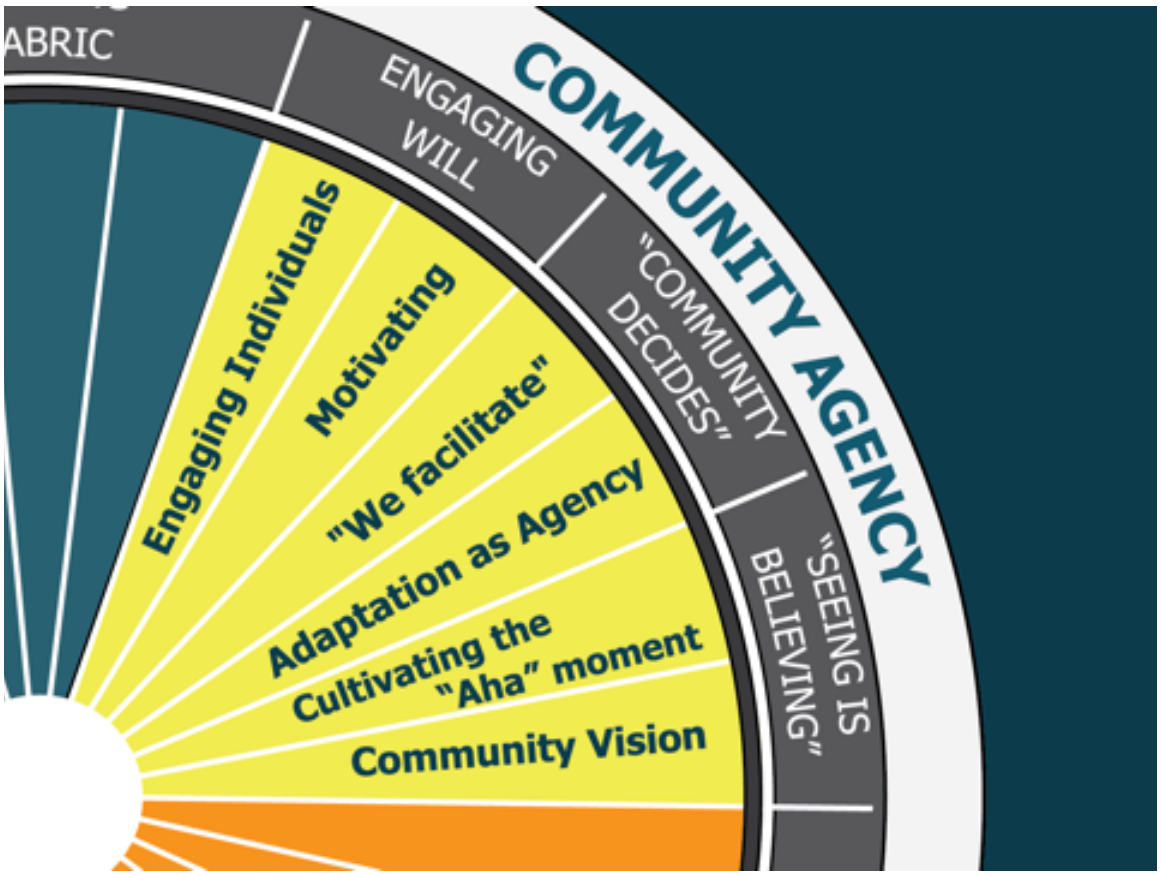

Fig. 17. Success Factors and the Information-Driven Behaviors of Must-Have II –Community Agency

C. Must-Have 3 - Community Agency

Practitioners, having strengthened the organization of a community through pedagogy and conflict resolution skills, continue their work as they inspire action through Community Agency.

Community agency is when a community recognizes and is confident in its own knowledge, capacities, and ability to determine its own best solutions, coming to act and advocate on its own behalf to bring about positive change. Practitioners reflected community agency as the only truly viable route for acquiring key knowledge needed for successful, effective, long-lasting results:

P77: *"If the community doesn't participate, it's meaningless, you can't even do it. Because all information and data that you gather is given to you by the community."*

Therefore, in this section, we see key success factors involving the skills to move an **organized** community to become a community acting in **agency**. Here again we see the critical way the four must-haves come together to bring success. Where, the arduous work of building trust (Must-Have 1) and facilitating community organization (Must-Have 2) are not just an ends unto themselves, but are also necessary in the progression towards communities achieving agency (Must-Have 3) and eliciting the information needed for achieving sustainable, long term impact (Must-Have 4).

The success factors in this section identify the advanced skills that were revealed by practitioners across contexts for engaging with an organized community to realize and act with its own power and authority on its own behalf. Practitioners commonly used and emphasized the need for skills and tools that supported their efforts to advance a community's ownership, voice, and action. Common across countries were the following success factors:

- Agency starts with will, and a willing community starts with willing individuals. Practitioners **engage** one on one to affect the **will** of individuals using motivation and mentorship.
- A common mantra among practitioners is "**the community decides.**" Successful practitioners intentionally align their role primarily as facilitator, and enable agency through adaptation and iteration by communities.

- **"Seeing is believing"** are tangible "Aha" moments where agency is realized. Community ownership and agency solidify in a personally realized and shared experience of positive results, induced through a physically visible action or artifact.

1. Success Factor 6. Engaging Will

Agency starts with will. In a variety of ways, practitioners showed community will to be the central ingredient for building community agency. In Organized Community (Must-Have 2), we discussed how practitioners relied on strong administration and group facilitation skills to help cultivate connectedness and form places of connection. Now we see, within those organized spaces, practitioners employing strong psychosocial skills to **engage at the individual level**, using **motivation and mentorship** to inspire individuals to find their own voice and act.

Notably, practitioners' engagement of will overlaps with the long-established fieldwork of *community awareness* and *community participation* in development programs. Possibly contrary to this traditional framing, we found **engaging will** to appear more as a central goal which these efforts support. In other words, bringing community awareness represents one of many motivating ways practitioners sought to engage will, and community participation was often treated as an indicator for willingness.

a) IDB 16. Engage at the Individual

Practitioners prioritized time, skills, and spaces for one-on-one engagement, revealing that the path to community ownership is through individual engagement.

P123: *"At community level, we consider that preparedness is very related to the people as individuals, related to the individual consciousness…. What I consider is that preparedness*

starts in the consciousness of the individual and go to the family and go through the community".

In Community Trust (Must-Have 1), we introduced the importance of spaces for relational interactions. In the dynamic of Community Agency, we see these spaces arise again as essential spaces for practitioners to engage with community members individually. One-on-one interactions provide essential information for the practitioner on how to engage individual will, which is an important step towards developing community agency. For example, in repeated house-to-house visits where practitioners come to know individual context, limitations, attitudes and needs. Further, in training classes instructors preferred smaller class sizes that enabled them to take time with individuals, clarifying some of the importance of earlier mentioned behaviors of being present and spending time[54]. Within these relational spaces, practitioners are able to interact not only to survey for a fixed list of questions but also to understand individuals' challenges to participation.

P120: *You can tell just by their reaction, you realize it is not easy for them. And then you may call them to one side and ask what schoolwork they had, what problems they had. Some of them may be having home problems, whatever, and it stops them from really enjoying and participating fully.*

P90: "*Because when you go through the camp, you're going to pay attention to the way people behave. Someone may be is out of the latrines, going just to have a little time to observe him up*

[54] Information-driven behavior #2: Be part of the Community

to his house. What is he going to do? Is he going to clean his hands with soap? Or what is he going to do? So I can give a little time to observe. "

P41: "*It's in the small group [where] they exposed their needs, for example, one said had no kitchen. Another one, the bathroom, the other, that the floor of the house. They were talking about their own needs or what they each needed and how we could collaborate. Then we… find out that this was what they* ***really*** *needed."*

P49: *"It happens that some people understand right away and for some people we need to repeat a couple of times. As a trainer, people are all different and I [have to] understand it... and maybe they think that it is not interesting and is not important to them. ...I ask them questions, I want to get them involved."*

A basic link revealed here is that successful practitioners not only value participation as the seed for belonging and ownership (as discussed in Mutuality (SF3), but also as an indicator of a more core objective: willingness. Other ways we saw practitioners detecting willingness ranged from creating ways to express willingness other than verbally, such as through written expression, to formally incorporating reading non-verbal cues into the design of projects. Mutuality (SF3) also involved the practice of creating of written documents between parties to express their commitment to a project. While this behavior secured commitments of agencies, it was also valued as an expression for individual commitment of personal accountability. When building emergency teams, for example, practitioners placed emphasis on a contract of commitment with members individual signatures.

Will is so critical that practitioners had developed a strong radar for discerning expressions of lack of will, and they were sensitive to these expressions by being intentional to respect a person's limits or their "no." P120 articulates the viewpoint we heard among practitioners:

P120: *I have to treat you with respect. Not because you are in such dire need, I still have to respect your wishes and your desires. So I will help you according to how much you want me to help you. And then I stop. Although I may want to go on further.*

Volunteers were trained to listen for cues to know how to stop a survey if someone expressed the desire to quit. In this example, the practitioners explained that they would often read people's non-verbal cues: for example, if someone moves back.

P120: *I don't push things. I still want to get you to a point but I would do it at your pace. Because there's always some physical, non-verbal that indicates to [me] besides the verbal. And there are some people that you realize that you cannot reach…because if you push them too hard, they're not ready. They're going to think that they'd want to resist you. So you really and truly have to help, hold back; help, hold back, and just recognize when they're ready.*

Successful practitioners take heed if they are pushing too hard and the need to evaluate their own behavior.

Another practitioner shared a success story about when construction work was required and the community agreed to work together on neighbors' houses. There were a few community members who did not want to participate in the work. The practitioner emphasized the importance to permit, without condemnation the unwilling persons to *not* participate in the project because forcing or coercing their participation would negate their agency and

compromise the trust that had been built. By allowing the individuals to choose whether to participate, and respecting their choice, kept a door open for participation later. In fact, in this case, community members who originally opted out of the construction work became willing after observing how it went with others' houses, and requested to join. With this later affirmation of personal will—the necessary ingredient for success—they were gladly included.

b) IDB 17. Motivate & Mentor

In Organized Community (Must-Have 2), practitioners strong administration and pedagogy skills in forging connectedness and organization of communities stood out. To extend an organized community to become agents of their own solutions, practitioners revealed a strong psychosocial aptitude for **motivating and mentoring** individuals.

RCRC is in the business of motivating. In one country, community workers explicitly stated that their job was to motivate, and HR assessed specifically whether candidates are "good motivators." Across contexts, practitioners gave examples of creative and impactful ways they are motivating all stakeholders to find the will and capacity to act. These included inspiring community members to believe in their own power, convincing governments to act in their mandated authority, and encouraging volunteers and team members to keep up the hard work of caring and loving in spite of the challenges and sometimes slow progress.

P104: "*It's more than just people participating in [planning]. It was important when all these government agency had developed a positive outlook toward the event, and when they realized that it was important to them that becomes the most successful part…..[to do this] I told them that if there is a mega disaster…since they are the ones who are responsible, [and if they] are not able to do their job effectively they will be questioned by the public. For example, if their*

drinking water supply is cut due to a disaster and they are not able to do their work at time, they will be held responsible. I tried to convince them in that way."

As trainers, managers, or facilitators, they adjust and refine approaches to motivate according to individual motivational needs. Standing on those qualities and behaviors discussed in Sincere Care (SF2), successful practitioners show higher sensitivity and insight in discerning the different ways that people are motivated and the different ways they will engage. To inspire and motivate communities, practitioners adjust to meet those deeper needs.

Successful practitioners employ many strategies for motivating will. Some practitioners conveyed relevance by seeking to connect to a personal experience, and other times they used encouragement or sensed that the person needed a challenge. Some created camaraderie and loyalty among teams or provided needed structure or help in seeing a successful outcome. These examples highlight psychosocial skills to be able to listen, discern, and adapt themselves to meet personal needs across such a broad spectrum. Stronger psychosocial skills were especially evident where motivating turned into mentoring as can be seen in the extension of this earlier example:

P120: *You can tell just by their reaction, you realize it is not easy for them. And then you may call them to one side and ask what schoolwork they had, what problems they had. Some of them may be having home problems, whatever, and it stops them from really enjoying and participating fully. So I usually help them, you know. Some of them I'm able to give them my phone number. They can call me with their personal problems, children problems, any problem that they want to talk about…*

In this important role of motivator and mentor, practitioners owed much of their success to psychosocial training and skills. Some were known for this skill—"*people tell me the problems*" —in the community, and some identified specific RCRC training in this area that had equipped them to be successful. This is particularly relevant as raising individual self-esteem was frequently named as an area they interacted with at could see the individual level that they also linked to a more collective problem to be addressed:

P114*: "What I do, I have a technique of saying, "You are beautiful today. Your hair is pretty." I find something positive.…I'm always appealing to your self-esteem. Because you find a lot of women, especially the poorer ones, who have a self-esteem problems. [Our people] have a self-esteem problem. I'm always trying to empower [them] because we recognize that it's a problem. It's a problem in [our country].*

We've always known if you build communities and give them a sense of self-worth, there's less things that you have to worry about coming out of the community: crime, sanitation issues where you can have cholera and other things being spread, epidemics as we're covering right now. If you can give them that sense of self-worth and just assist them by looking at some of the issues that they have and assisting them overcoming some of the problems that they have, then it makes [problems] easier [for them] to deal with. It makes them more fore-thinking; they start to come up with ideas; they start to develop ways of turning little projects into big projects."

Thus, in these examples, we can see how stronger psychosocial skills used to motivate at the individual level provides the necessary building blocks for engaging and motivating whole communities to agency.

2. Success Factor 7. "The Community Decides"

"The Community Decides" is a common mantra among successful practitioners. Claiming the role **"we facilitate"** and bringing forward community voices by using **adaptation as agency** are key ways practitioners ensure the steering wheel remains in the hands of the community.

P38: *"So the first thing is to talk about where we started and that,* ***people, neither in the worst conditions, lose their ability to think and decide what to do with their lives****. And in that logic, we have to listen, recognize what people have chosen as survival strategies, and guiding the processes, without ruining the people's choices."*

The findings in Organized Community (Must-Have 2) made clear that for practitioners to be successful in encouraging the knowledge of the community to be known, practitioners must firmly relinquish decision-making and situate themselves as co-learners. Here we see how successful practitioners carry that a step further in practice to maintain a position where they **do not** decide nor disempower the community. For communities to truly have agency—and therefore, to contribute the information needed for long-term success—practitioners create clear and transparent ways to maintain their own role as facilitator and allow for adapting and iterating approaches, plans, and implementation for accommodating community ownership.

a) IDB 18. "We Facilitate"

Practitioners are intentional about their role as facilitator, placing checks and balances on their own interference. One way they do this is by being explicit and clear from the beginning that RCRC's role is to facilitate:

P97: "*The role of [RCRC] staff is just facilitation. To facilitate the coordination, there is involvement and collaboration with local stakeholders and other local bodies/organizations. These are the reasons for success."*

Motivated by respect for community knowledge and the awareness that only community –led action can achieve sustainable results. For successful Mutuality (SF3), practitioners valued a sense of belonging of participants. Here, belonging gives way to ownership as practitioners again emphasized the importance of defining clear roles upfront, placing an accountability on themselves among stakeholders. By clearly and transparently stating their role as facilitator and then achieving it, practitioners prove their trustworthiness, and with that trust in place, communities become open, more willing to contribute and step up to ownership.

P93: "*The community people say, 'That is not A RC program.' The community people say, 'That is our program. RC only facilitates to implement the community program in a fixed project time. But this is our problem.'... Community people feel that. If you follow different types of steps...observation, different types of visit, you can feel community ownership. They will say, 'That is our program.'"*

Underlying a practitioner's discipline to facilitate the community to develop and own these plans and solutions is their co-learner[55] mantra: *"the community knows best."* This mantra is a further affirmation that the information that practitioners most need for success—and

[55] Information-driven behavior #10: Act as Co-learner

therefore what must drive the project design and decisions—are these very contributions by the community:

P73: *They tell you, 'If we did this—if we dug the trenches, if we planted the trees, if we made some lakes, temporary lakes along the riverbank—it will prevent this water from flowing.' And then we, so then we have to plan for this and then we always draw an action plan. We tell them to draw the action plan, the community action plan, which they own. It's drawn by them. We only support them in facilitating, and we're just guiding them. And then, but the ideas are theirs."*

In other words, for programs to have a lasting impact, they must be owned by communities. A practitioner's ability to honor the community's autonomy had a lot to do with practitioners not imposing their own will. To do so would impede the community's agency—and therefore, the information needed for success. Motivated by a respect for community knowledge and agency, practitioners who were successful realized that access to the information necessary for success partially depended upon their own self-attunement. Many spoke fervently when explaining that they themselves do not decide. It was not a casual statement but an imperative, backed by strong personal awareness and discipline. This intentionality is evident in Engaging Will (SF6), where practitioners emphasized discerning and respecting non-verbal cues that express a lack of willingness or "no" decision:

P120 *"...and to others who may fail at first, I say "Come back and finish the course" and I tell them two, three times and they don't and I leave them. I say "When you're ready, I'm always there to help you" that sort of thing because I realize that they are not ready. But they have to be ready."*

Other examples of practitioners honoring community decision-making included upholding the community selection of participants and leaders, direct community management of assets, and communities receiving their own funding to support their own plans. This priority of community decision-making underlay the robust capacity-building activities that practitioners built into the numerous programs we observed. For example, meetings often had a dedicated secretary to record decisions and to assist with heavy administrative requirements. The Practitioners taught communities to record and report on their projects and volunteers, providing training in leadership and administration skills to those who had been nominated by the community.

P73: *"So we got community representatives in each, trained them on how to write reports and recordkeeping, you know, just basic skills, leadership roles, and also trained the wider community on what risk reduction is all about, how can they participate in risk reduction. And for me, I think that has been the reason why, besides the usual being the first on site when a disaster happens, I think that has also helped gain their trust in us."*

As also mentioned under Organized Community (Must-Have 2), while the facilitator role is neutral, it is not passive. The practitioner is situated as co-learner and contributor, often a contributor of technical expertise. However, the contributions that practitioners more critically relied upon for success were predominantly those that help communities to be organized and informed, to know and act in their own voice. For example, the above quote describes administrative capacity building that significantly supported the community in further efforts to engage and practice its own agency. Applying those administrative capacities, communities

collaborated with local government groups, sharing copies of their reports so that community plans could be incorporated into local government plans. Practitioners' support of that community-government collaboration was vital, and practitioners also facilitated official recognition of the community groups that made the groups eligible for funding to carry forward the work they had planned. This concrete example of community empowerment—communities receiving their own funding to support their own plans—directly tied back to the community-developed written plans produced after training in leadership and administration skills. To summarize, practitioners identified their successes more closely with facilitating community decision-making and structuring projects to enable community ownership than with having access to sectoral technical expertise.

The examples of efforts being driven by the community and facilitated by RCRC shows community members that RCRC is there to support, as mentors and facilitators, not to make the decisions. And in practitioners' discipline to facilitate but not to decide, trustworthiness of RCRC is proven. When communities are able to make and act upon their own decisions, they have agency—and are equipped to respond to changing circumstances, challenges, and environments.

b) IDB 19. Adaptation as Agency

Adaptation is where community agency is born. Communities walk in their own power when they can adapt plans, programs, and priorities to reflect their own will.

P42: *"I think dignity must be present during the entire project. And it is true since the time you approach the community and you tell them the option that is available.* ***It is about giving them the possibility to participate and they themselves to be the managers of their own***

***transformation**, in this case the project. So they are the agents who have to do the adjustments and say, "This goes here, and this goes there," because finally this is for them. From the beginning of the project because you don't come to impose your plans of the project; you come to propose them as an option or an alternative, and **they are the ones who do the necessary adjustments.** They might say, for example, "Coffee doesn't grow here; potatoes grow here." They are the ones who know their environment, and they know best what is the most optimal."*

"We Facilitate," the previous information-driven behavior of the "The Community Decides" (SF7) reflects a learning perspective that respects community agency as the primary contributor and driver of success. Practitioners guided by this mindset, then emphasized adaptation and iteration of ideas, programs, plans and tools by community for bringing their voices forward. Practitioners consistently told us that communities had the best solutions and that for solutions to improve conditions over the long term, communities had to own the solutions. Agency can be achieved where practitioners have carefully situated themselves as co-learners (Information-driven behavior #10) creating environments where communities are encouraged to initiate learning, not just to receive or shape learning initiated by RCRC. In making room for experiential learning, allowing agency to be practiced and developed. Key is opening space for beneficiaries to request the kind of activities and training that they would find interesting and useful, as seen in this example:

P37: *"We came with an initial proposal that we made from our perception. However, while working on it, we realized that it didn't have the effects we were expecting, especially on the motivation of the population. After the suggestions the youth leader gave us, we reprogrammed the activities and had an activity that was little more interesting for them."*

A key point emphasized by strong practitioners was that for programs to have a lasting impact, they must be appropriate for communities and individuals within those communities. Even community-developed programs may need to be adapted to meet needs at the individual level. Organized communities have a strong social fabric[56] characterized by knowing the strengths, contributions, and individual needs of its members. Thus, when communities are walking in their own power (that is, when organized communities have agency), they are well equipped to make these adaptations. Adaptation enables the needed ownership and respectful, appropriate engagement down to the individual level.

Tools that allow adaptation give communities an opportunity to express their own priorities. During one sensitization exercise involving Muslims, the practitioner modified depictions of the household environment to reflect the Islamic tradition of keeping animals in a certain quarter. The practitioner explained this flexibility in terms of a need to have the communities "recognize themselves" in interacting with tools provided by the RCRC. Creating ways for community to see their contributions and power builds their capacity, motivation, and sense of agency.

3. Success Factor 8. Seeing is Believing

"Seeing is believing" is where agency becomes explicit and can be shared, inspiring practitioners' and communities' confidence in long-term success. Practitioners found that community ownership and agency often culminated where the community members, together,

[56] Strengthening Social Fabric: Success Factor 5 (SF5)

could physically see the positive results from their own contributions and accomplishments—often through the creation of an artifact (i.e. an object created by the community such as a map, or a building) or personal experience. Evidence of the community believing in its own power are seen in "aha" moments, driving practitioners to use and seek tools and methods for **cultivating "Aha" moments,** and welcoming **shared community vision** to form, giving rise to communities expressing agency: acting together within in their own power as their own agents of change.

a) IDB 20. Cultivating the "Aha" Moment

The "aha" moment is where will is transformed into action—that moment when individuals clearly see their potential to meet their needs and the needs of their community.

P123: *"You have to find a way for them to SEE what they have, what they can do—then they will believe and take action."*

Some of the most commonly named tools were those that aided practitioners in bringing individuals and communities to collective "aha" moments. Mapping, mitigation projects, and modelling were the most consistently named methods that would provide an actual tangible picture or example for the community's shared experience. The most common examples occurred through mapping tools found in the VCA. In these exercises, the community becomes engaged and motivated to identify community-level needs.

P72 "*...in utilizing one of the tools during the VCA, the historical timeline, we realized disasters have been happening before, but the magnitude was different and the issue is why. Okay? And the beauty of a vulnerability assessment, we kept probing the why, the why, the why, and also using the problem tree."*

All the hard work practitioners have invested can be seen at this achieving moment where communal knowledge emerges. Once the community has drawn an historical timeline of hazards and vulnerabilities in their village and populated and assessed it with their own knowledge—and with the help of a trusted and skillful practitioner's probing—it creates the visual for an "aha" moment. When they can visibly see their results in one place, their achievements and sense of their own knowing becomes tangibly real to them.

Mitigation projects were also key places for individuals and communities to come to believe in their own abilities. In mitigation projects, members do the work and, in the end, have a visual beacon to their own power and abilities. For example, one community that suffered from annual floods coordinated a community-wide effort to dig and maintain trenches to divert flood waters. When their community was spared flood damage, the trenches became a powerful symbol of their own ability to protect themselves and even inspired surrounding communities to engage in this practice. This is where we can see how important that attitude of "we facilitate" comes into play—this recognition of their own capacity would not be easily seen if the practitioner steps in to do the work.

The "aha" moment doesn't always have to be of one's own experience. Practitioners were conscious of serving as models for the community. One field mobilizer noted that while he did not want to dress fancy and make the community feel like he was different or better, he also recognized that he must model personal hygiene and would, therefore, keep a certain standard of cleanliness. Through behavior in meetings, practitioners also provided examples for how to respectfully listen, relate to and encourage one another, how to communicate effectively, and how to lead.

An "Aha" moment firmly captures one's will, turning community members into lifelong volunteers who make up the backbone of the organized, prepared, and caring community. This key moment collectively turns communities into faithful partners committed to a shared vision for change.

b) IDB 21. Community Vision

Mapping and plans were key tools for success because they facilitated communities in developing a shared understanding of reality, risks, and capacities, as well as a positive, shared vision for their future.

P33: *"I remember six, seven years ago [when] we went to a village, there was just the field. They were really tough the community and with the RC, they drew the neighborhood and the community center, play ground. They kept these nice drawings. I went there seven years later, and they showed me, "Do you remember? This is our playground, look it." They kept this as a plan. It is not totally finished, but they keep working on it even when the RC left them three years ago, because they have this as a plan."*

The above example shows the importance of a shared vision for channeling and sustaining community agency. As we have seen throughout Community Agency (Must-Have 3), participation reflects a measure of will, which begins with individuals and spreads throughout communities. When will is expressed through adaptation of plans, programs, and priorities, it gives birth to agency. This agency becomes explicit when communities experience an "aha" moment, recognizing their capacity for walking in their own power. As a final component of agency, shared community vision is key to channeling that communal agency toward particular, practical actions (i.e. solutions) that benefit communities. This vision lays the groundwork for

long-term impact when communities see the vision as their own to craft, adapt, and carry forth over time. Thus, we see the importance of visual maps and documents that create a shared vision, uniting the community to move forward in actions into the long term.

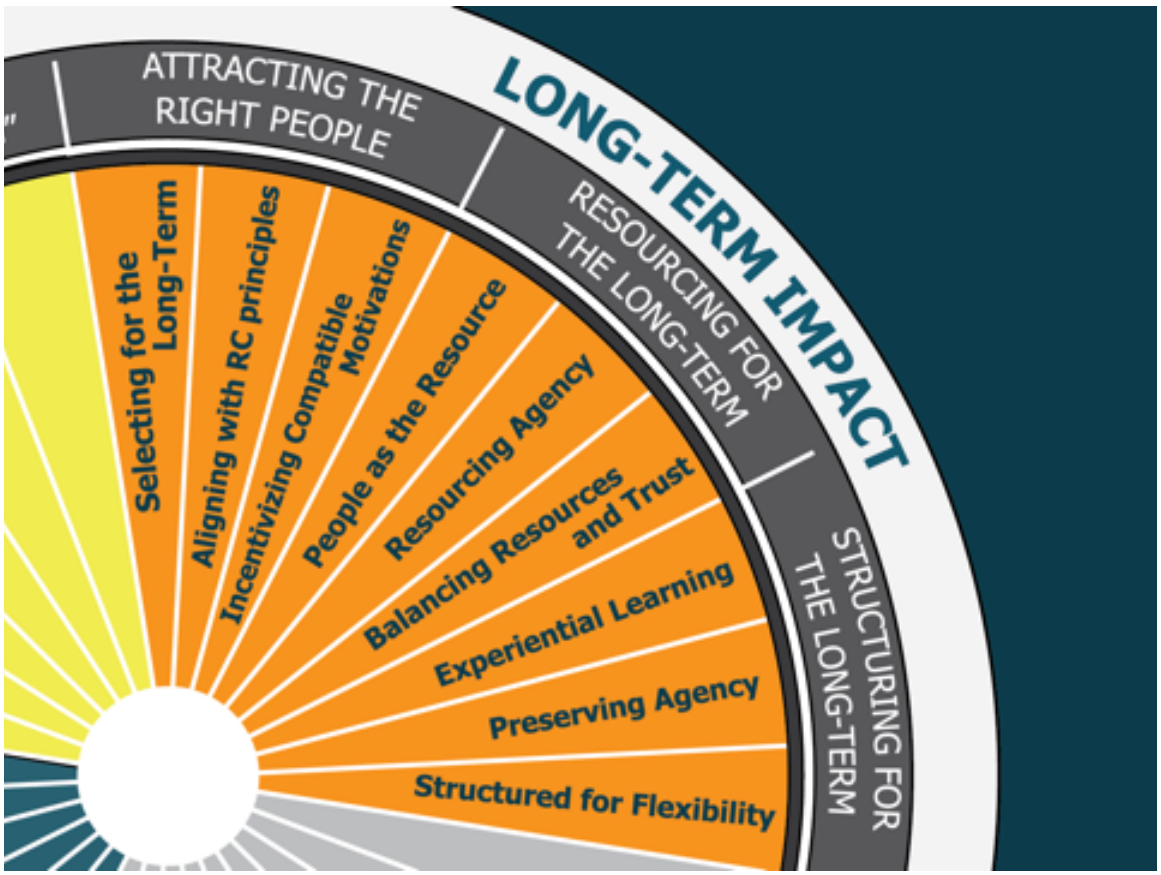

Fig. 18. Success Factors and the Information-Driven Behaviors of Must-Have IV – Long-Term Impact

D. Must-Have 4: Long-Term Impact

Through the activities they focused on, and the reasons why they do what they do, successful practitioners repeatedly revealed that a central way they define success is in whether their work will have lasting impact for communities. Practitioners are constantly asking what will make preparedness "take"– in other words, what is needed for preparedness to become rooted into the communities for the long-term? Sustaining good preparedness is not what one might think: programs lasting forever, program design replicating over and over across contexts, funding sustained through appearing on the news and attracting

donors. Instead, practitioners expressed that they intended their work in communities to leave a sustained sense of agency and flexible skill set, rather than a sustained presence of the national society.

Three additional major themes of **selection, incentivizing,** and **resourcing** emerged as prioritized behaviors undergirding the progression of must-haves (Trust→Organized Community→Agency→Long-Term Impact). These major themes play supporting roles to achieving the four must-haves and are especially interconnected with long-term impact. Ultimately, we found selection of people and incentivizing behaviors, creative resourcing, and space for learning and adaptability all at the heart of creating long-term impact. The following are the success factors identified as key to their work having long-term impact:

- Successful practitioners set up communities for long-term success by **attracting and retaining the right people.** From the beginning, they are noticing different capacities of individuals participating in RCRC activities and creating incentivizes that attract and keep people who ascribe to RCRC principles.
- Overall, committed volunteers and trusting relationships emerged as the most valued **resourcing for long-term success**. Practitioners needed resources that sustained the capacity and commitment of personnel, preserved trusting relationships, and supported the agency of communities.
- Repeatedly, practitioners held a learning perspective in their approach to information, recognizing communities as the primary place for learning. The need to be flexible and dynamic was accommodated by mechanisms and **structure for the long-term** primarily by preserving adaptation and iteration of ideas in programs, plans and tools.

1. Success Factor 9. Attracting the Right People

Careful, intentional selection and incentivizing emerged as major themes in supporting the must-haves for successful work. **Selection** and incentivizing were intentional foci of practitioners very early on in the process of preparing for disaster preparedness work and were often noted for their critical impact on long-term success. Setting up communities for long-term success starts with an initial focus of recruiting and **incentivizing sustainable motivations**, and in particular individuals **aligned with the RCRC mission** from the beginning.

a) IDB 22. Select for the Long-Term

As highlighted in Rapport Building (SF1), selection is conducted through the structure of recognized authority of communities and by community members. Although selection criteria were not organizationally formalized or explicit (except in one country), successful practitioners consider in the very early stages who are the people needed to participate for long-term impact. When speaking to community leaders about nominating response team members, recruiting volunteers for going house-to-house, or training project participants, RCRC practitioners consider a range of skills which they have learned contribute to successful teams and work. Practitioners consider that volunteers often become future community leaders and determinants of the success of the community's disaster preparedness. Therefore, careful selection is where long-term success starts.

P76: *"Making sure that the volunteers are loyal and stay with RCRC for a long time, that is also important. Because a national organization like us without volunteers is somewhat crippled."*

Volunteerism serves as a pipeline of reliable practitioners. Many current RCRC practitioners began as volunteers, and many continue to fill roles as volunteers or staff members. Considering

this common path to long-term engagement, experts' (often implicit) focus on careful selection makes sense. While practitioners considered a range of abilities and qualities in selection criteria, these were the most emphasized criteria across contexts:

- **Knows the community:** The person is familiar with the community—its various branches and subgroups, needs, norms, and concerns.
- **Well-respected in the community:** The person is considered to be reliable, trustworthy, and well-respected by community members.
- **Initiative:** The person takes initiative, is proactive and busy, looks for needs and opportunities to meet them.
- **Motivator:** The person motivates others, often through their own dynamic nature and way of engaging with and encouraging others.
- **Aligned with RCRC principles:** The person has selfless motives and personally ascribes to the RCRC principles.

Of the selection criteria common across countries and contexts, the final criterion—personally ascribing to the RCRC principles—particularly stood out. Practitioners said they would recruit "*only people who are interested to give service to the community*" and that a "*RCRC volunteer cannot do anything without following the principles, that is, the guiding principles [of] humanity, neutrality, impartiality, voluntary service…*"

b) IDB 23. Alignment with RCRC Principles

Consistent, long-term involvement is more likely when RCRC practitioners are motivated by ideals compatible with the RCRC principles: a desire to contribute, to have a purpose, to care for others.

P63: "*Where we've done **really very strong dissemination of the values and the philosophy of the Red Cross** is where we've had good success. You'd find somebody is not joining because he or she is suffering from lack of what to do, but rather because they **believe in the philosophy of the organization**. I also credit it to where the people instill … a community-ism—where you find the people of the community are still interested in what happens in the other person's life*."

The way RCRC principles are visible and have integrated a constant tribute of them at the beginning of their meetings, for example, attracts people who desire the opportunity to serve communities in a likeminded way.

P112: "*RC gives you an opportunity that you can be a part of those service organizations and still be a part of RC giving back to the most vulnerable. And so it's us reaching out… and mobilizing resources for the critical persons, the most vulnerable persons but ensuring that we do it within our own humanitarian activity: ensuring that we do not violate our fundamental principles… and so that helps us because there are some persons that feel that our principles because they are neutral, we are not aligned to a political party…"*

People who are attracted to RCRC because of its principles are those whose primary reward is found in:

- **Helping others:** In some cultures, there are widely held values of coming together to care for vulnerable people or to help one's neighbors. Often in these cultures, RCRC principles are appealing because those principles resonate with values people already ascribe to in terms of caring for the vulnerable.

P115: *"It is always interesting and it's fulfilling. As I say, when you look back at it, you look at the people you helped and sometimes you go into some areas and some people calling to you… and they say, "well, you helped us." You know, it is really a joy."*

- **Sense of belonging:** In some cultures, particularly those in which the government has traditionally more robustly assumed the role of caring for the vulnerable, people's primary reward for involvement with RCRC may look different. A sense of belonging—belonging to one's team, loyalty to team members, and a sense of strong cohesion—is deeply motivating.

P84: *"In fact, what is motivation? It is between us. First, you need to make the person understand that at [the society] here, it is like a family. We are all here together, it is like, "He my older brother, I am his younger brother." It's one family… The last Sunday of every month the youth meet here; we do some simulation exercises on First Aid. We stay here until 5 pm, and have fun together like in a family. People tell jokes, and everybody laughs."*

The strong emphasis and visibility of the principles among those known for successful work helps to attract people whose motivations for engaging with RCRC work are sustainable. Incentivizing these sustainable motivations is another important focus of strong practitioners.

c) IDB 24. Incentivize Sustainable Motivations

The work that volunteers engage in is challenging; some find this work inspiring, while others find it discouraging. Practitioners explained that those who had "sustainable" motivations, that is, remained committed and involved over the long term tend to "self-select." For example, many workers we met had been introduced to their RCRC society as beneficiaries of a project

and then became lifelong volunteers as a result of RCRC's work and contribution to their family. Therefore, approaches emerged across contexts that emphasize the lack of monetary gain.

Small tangible incentives are useful not only for retaining people but also for initially recruiting them: for example, serving food at meetings, providing transportation or reimbursing part of people's transportation costs, and providing a small amount of cell phone credit. These small tangible incentives make it financially possible for people to gather together, and serving food encourages the team cohesion and sociability that many find motivating. But tangible incentives were used judiciously by strong practitioners, who were also careful to disincentivize participation by those motivated by personal gain:

P122: *"Some will look for gain. Because they will feel in a sense that if they are at the shelter and things come in, …they can benefit from that as well. You know, they can get a mattress or things like that. But we always let them know that the* ***volunteers get served last****."*

Personal gain, in terms of receiving goods and in terms of earning high salaries, is not only an unsustainable motivation—that is, fluctuating and insufficient funding makes financial incentives impossible to maintain—but more importantly, it erodes trust. Communities are aware that RCRC practitioners make little or no money for the important work they do, and this selflessness is an important component of the trust that communities have in Red Cross/Red Crescent and the perceived credibility of volunteers.

P84: *"All that you do here, you know, that is volunteer work. You don't expect a salary. There is no salary. It's all about giving the little time you have to the Red Cross. […] People see written on the backs of our shirts "Red Cross" when we go around [the community] doing this sensitization, and they all know that the work we're doing is for free."*

Even more important than small tangible incentives, intangible incentives emerged as common across contexts and cultures, sustainable in fluctuating funding environments, and valuable in retaining trust and relationships. Providing close community,[57] training and certification, encouragement, and recognition were emphasized.

Belonging to community, both as a team member or as member of the communities practitioners worked in, was an incentive that inspired commitment, particularly in difficult times:

P43: *And sometimes it was this year - actually it happens every year - in the beginning when donors have not approved our programs …and we had no salary and sometimes we felt very depressed. Like "Oh, let's leave from this. We don't want to work here. I have no money for lunch." or something like that. But even though we were saying that, nobody left. Because we still come and are working together with each other. I don't know, it's the kind of bond that makes us stay here. Even salaries in other organizations are much higher, there is no community like this.*

Training served as a both a recruiting and retention incentive by providing a place where relationships began and also in terms of professional credibility and greater opportunity:

P76: *"It was during those trainings that we recruited and worked to earn the loyalty of the volunteers."*

[57] Discussed in Information-driven behavior #4: Motivation Rooted in "Love"

P28: *"Having our own educational department allows people to get certified. That is something that volunteers value. It is important for them to know that their training is backed up by a certification."*

P120: *"Persons, yes, want the course and also because RC is international, once they're trained they can use their certificates and possibly go abroad and make them more marketable."*

However, primarily, training serves as an incentive that enables people who are motivated by a desire to help people, to fulfill that calling:

P117: *"I remember there was one specific situation where this little boy drowned. He was about twelve years old. It was the summer before he was supposed to go back to school. He died on the route. He died and I revived him en route to the hospital, and somebody said to me, "You good, you know!" And I was like "No, I'm just well trained." And they were like "Seriously?" I was like "Yeah, I got training from RC…" […] And I remember the father saying "Boy, what's the charge?" And I said "No man, there's no charge! A 'thank you' handshake is fine." His mother hugged me and I couldn't breathe. She was just squeezing the life out of me. And I say to persons especially within RC, we do it because of the people we help and not for any other reward or status."*

Several participants mentioned that recognizing and encouraging good work was an important incentive for continued involvement. Key to this point is an understanding of "good work" as work that meets needs of communities, that supports RCRC principles, and that builds the capacity and connections of team members. In other words, the same factors motivating initial involvement can inform the motivation of continued involvement. In at least one country, for example, they have retreats and holiday parties at which they thank volunteers, recognizing

them for their service and commemorating the number of years they have been involved. Another example of recognition is programs like "Club 25," in which people are encouraged to join the club by donating blood at least 25 times. Club members receive no financial incentive but rather are recognized for their commitment, creating a sense of cohesion, accomplishment, and appreciation. Members were also encouraged by team leaders who took time to motivate volunteers day to day, for example, by encouraging them through positive chants and sharing sayings that "make everybody feel the spirit of volunteer work and that create a positive atmosphere." In other words, team leaders encourage volunteers by reminding them of the incentives they receive in terms of feeling fulfilled and satisfied by helping others.

P86: *"Our volunteers have a motto they say when they are together, 'Nothing makes me happier than helping someone who is suffering and hearing him say thank you.'"*

In summary, incentives are important for recruiting and retaining people whose primary reward is in helping others and having a sense of belonging. Incentives targeted to those motivations include small tangible incentives that enable people to meet together and cultivate a sense of belonging, as well as intangible incentives that increased people's capacities to help others and recognize them for good work. Sensitization, recruiting, and training efforts repeatedly conveyed that 1) good work is that which meets community needs, 2) meeting community needs is the greatest reward of RCRC practitioners, and 3) work that is recognized and commended is that which meets needs. This message attracts those who are rewarded by helping others and downplays other rewards, such as financial incentives, which are not associated with the strongest practitioners, and which are difficult to sustain.

2. Success Factor 10. Resourcing for the Long-Term

Successful practitioners found creative solutions for resourcing that which would preserve and improve the long-term impact of RCRC. In general, these creative solutions filled gaps in organization and program resources, and when societies had a critical need for success and a gap in resourcing it, they got creative! Creative resourcing initiatives show us what successful practitioners needed most. When they could control resources, they prioritized **retaining experienced personnel** within the organization, **supporting** communities' initiatives to act in **agency**, and reinforcing trusting relationships. Practitioners also revealed an ongoing need to **balance** an organizational tension between **raising resources and protecting community trust**.

a) IDB 25. People as the "Resource"

Congruent with the previous success factor, we continue to see that people and relationships—not technology, technical solutions, or donations—are the top-priority resource for long-term success. Rightly motivated, trained, and trusted people are the common denominator of successful work:

> P39: *"The first thing, the most important is trained human resources and the receptivity of the people that we are going to intervene. For us that is the most important."*

The RCRC organization itself centrally prioritizes capacity building for communities, volunteers, and staff, and this capacity building was part of activities in every project we heard about or witnessed. However, at a much deeper level, societies experienced a critical need for resourcing solutions to keep these trained, experienced, and trusted personnel involved in RCRC over the long term, especially those who have established trusting relationships with

communities. Selection of volunteers and staff who embodied the qualities we discussed above in SF9 attracted people who would be willing to go above and beyond for communities and had therefore earned trust for RCRC. It is through this trusting relationship that information flowed, and that information flow was important for strong preparedness.

P65: *"We have strong preparedness because we have a wide range of volunteers who are being trained in different areas. We have a [response team] made up of 25 people with different fields. And we have trust, people have trust, the community has trust in RC. And therefore whatever happens in the community, we are allowed in it. And also this is because of the selection criteria of volunteers from different places. Therefore getting information from the community is more, is easier for us to get. Then when it comes to execution, execution has positioned itself in a manner that it is ready to interface with any situation. Many of the human resources is there, and it is well prepared."*

The impact of funding on RCRC's ability to attract and retain people varied across contexts. In one country, for example, all practitioners below headquarters level were unpaid, so practitioners were limited to those who did not need paying jobs: e.g., retired people or married persons whose spouse earns the family income. At the opposite extreme, one country had sufficient and consistent funding that enabled it to attract and retain the strongest practitioners without threat of losing them to funding gaps. In the middle were cases in which the ability to pay staff fluctuated. Financial challenges to retaining key people over the long-term include gaps associated with project-to-project funding, funding restrictions, and delays in receiving or accessing expected financial resources. To mitigate the impact of these challenges, some practitioners would work without salary out of loyalty or because of their commitment to the

work. We saw across contexts that the line between volunteer and paid staff would blur, sometimes because financial challenges inhibited the ability to continue paying staff for their work or caused gaps in ability to pay. But it is not always possible for skilled, trusted practitioners to work without pay, and in some countries inconsistent funding contributes to high personnel turnover.

This finding—that inconsistent pay impedes the ability to retain the strongest practitioners—is not incongruent with the earlier point about sustainable motivations. Whereas high salaries risk attracting people motivated by personal gain and unwilling to go above and beyond to build relationships and trust with communities, consistent pay enables skilled, trusted practitioners to continue working with the organization long term. It enables RCRC to retain the most important resource for long-term impact: people with both the skills and relationships needed to conduct successful work.

In countries that struggled with inconsistent funding, societies engaged in creative approaches to retain the strong, motivated practitioners critical to their successful work. For example, they focused on maintaining the connectedness of their volunteers during financial dry spells by 1) keeping up-to-date records of volunteers and contacting them regularly, 2) holding team gatherings around town to keep valued connections among members strong, and 3) inviting workers to participate in training offered via other projects. In this way, societies intentionally strengthened relational incentives for participation while they awaited available funding.

Other strategies included borrowing temporary funding between departments, programs, and projects as stop-gap measures. For example, one society provides official department-to-department loans when funding has been promised but delayed. While managers are aware that

borrowing across project budgets is frowned upon, when this practice enables them to retain key people during a financial dry spell, they prioritize what they know is most important for long-term success: retention of trained, trusted people. This practice was not without sacrifice, as project officers, for example, may accept reduced pay while maintaining the same level of work in order to divert that money to practitioners to keep support going (or relationships maintained) in other projects. This is particularly true when it was felt that a gap in relationship would damage a community's progress. In some cases, teams even pay their coworkers rent or salary out of their own pockets during funding gaps.

In addition to creative financial strategies, strong practitioners had a long-term view of recruiting as key to the most important resource for successful work—that is, committed and trained people. Youth programs and school programs were key ways that practitioners invested in the future of human resources—by engaging those they saw as the next generation of RCRC volunteers. Many of these youth exhibited the selection criteria discussed in Attracting the Right People (SF9), especially initiative and a dynamic nature.

P84: *"First what makes the difference is that we have a youth that is very dynamic and energetic. For example when there is an activity here, when you call the youth, they are ready. They mobilize themselves and are ready to get started with the work."*

In addition, many practitioners personally recruit with an eye to succession: who will take up the work of future facilitator-motivator role and carry it into the future within their communities or the national society. Strong practitioners are aware that volunteerism is a pipeline for career practitioners, so they consider long-term ramifications of supporting the most important resource for long-term work: trained and trusted people.

b) IDB 26. Resourcing Agency

When communities can make and act upon their own decisions (i.e. when they have agency), they are equipped to respond to changing circumstances, challenges, and environments. Practitioners are consistently seeking ways to fund those community-driven initiatives and needs that may not have been part of the original funding but *are* prioritized by the community. To secure funding to support locally designed projects, some practitioners conduct their own fundraising. In this way, they ensure the flexibility to use that funding according to community priorities: supporting work that is desired, designed, and enacted locally.

Practitioners described several strategies for garnering and funneling resources into activities driven by communities—that is, strategies for resourcing agency:

- **"Top-up" projects:** These projects grow out of long-term relationships between communities and local RCRC practitioners, as community members discuss their needs and their capacities for meeting those needs. Practitioners engage with community members to envision solutions that cost almost nothing and then "top up" the community's efforts with a very small amount of funding to enable the work.
- **Invisible projects:** Invisible projects are collaborative local efforts to improve lives that require no financial funding. The name "invisible projects" illustrates the common misperception of funding as vital for long-term impact, as this term emerged from the discovery that local RCRC practitioners had long been working with their communities to improve lives but had not discussed these efforts across the organization because they believed that if it was free or not part of a specific project, it did not count. Invisible projects resource agency by calling for the investment of time, planning, coordination,

and facilitation to support projects that are locally envisioned and enacted. Thus, these projects do not involve financial resources, but they do involve the most vital resource: trusted, committed people.

- **Revenue raising at the branch or chapter level:** This is a strategy that practitioners employed with mixed results. In two countries in particular, we saw that raising revenue at the local level was encouraged as a way to resource agency. One of the major differences in the level of success appears to be training. In one country, there was a strong focus on increasing agency by teaching people how to raise their own revenue, an approach that resulted in communities with their own resources and the capacities to sustain and direct those resources. Where the expectation of revenue raising was not coupled with training, people were less confident of their ability to do so and unsure of how to proceed.
- **Partnering with local government and other NGOs:** Long-term impact is also supported by structuring for flexible partnerships between the societies and other stakeholders such as government actors and other NGOs. RCRC's formal auxiliary role to the national government and ongoing relationship with local government agencies are central not just to building the social fabric, but building the capacity of communities. Local agencies frequently were the key stakeholder responsible for technical training to communities such as in construction or job training, or in providing response team training in areas such as psychosocial skills or responding to fires. Relying on one other or referring each other to cover gaps in needs was common practice. As was active coordination with other NGOs to ensure there was no duplication of efforts.

We see here that resourcing agency is key to resourcing for the long term, as it is communities themselves who know what they need. Their ability to design and direct the work is aided when organizational structures shift power to the local level to enable resourcing agency. Practitioners engaged in several strategies designed to resource agency, strategies useful not only for stretching resources but, more importantly, for retaining community trust.

c) IDB 27. Balance Resources & Community Trust

RCRC practitioners known for strong work understand personnel and relationships to be their most important long-term resource. Financial resources and the equipment and services they purchase are an important secondary priority—and this is a very important reason—where they support relationships. While financial resources can amplify successful work, they can also jeopardize it—requiring an intentionality in understanding where resourcing can risk trust with communities. A key tension we observed in societies is balancing two important priorities: securing funding (including the visibility that leads to donations) and supporting the building and preservation of community relationships. Balancing these priorities can be challenging because while it is widely known to all RCRC personnel that funding is required to function, practitioners who implicitly know the crucial role of trust for long-term impact face an ongoing challenge to try to make that visible to those in the organization who do not regularly engage with the community. Thus, an important organizational implication is discovering and making visible those places where the long-term capital of trust might be jeopardized by less yielding pursuits for financial resources.

Successful practitioners often find themselves as a minority able to see where funding decisions can impact community trust and are put in the position of having to make the long-term "revenue" of trust visible for the rest of the organization:

P39: *"Sometimes in the [branch] we are looking for resources but this project is not going to provide any resources to the [branch]. We are not a priority. So, we also made visible Red Cross actions at the municipal level… Then the [branch] can see that the* ***revenue is not monetary, but it is visual****."*

Building and preserving relationships with communities is less flashy and harder to measure than financial resources, meaning that trust is more nebulous than other priorities that can threaten to outrank it—such as raising donations or appearing on the news during disaster response (having a "CNN moment"). Yet, we found trusting relationships with communities are at the core of successful long-term impact: "*We have an advantage, the community trusts us.*" Without these relationships, work cannot even begin, much less be sustained.

P33: *"Another example is in [community name] in a program with relocated IDPs. The municipality gave them land to build houses. There was construction; there were the resources to do it,* ***but there was not trust****. The community didn't trust the authorities, the community didn't trust the constructor, and the constructor didn't trust the municipality, and everything was stopped. We were there. We didn't have money, and we started this process because of something that is really valuable here and in many countries is that* ***RC is trusted by the population****."*

A related tension that practitioners face is bargaining for time and community's trust[58]. Some donors place requirements and restrictions on funding because they want to support fast positive outcomes. But building relationships with communities and supporting community's own ways of operating is time consuming, and resourcing the agency of those communities requires flexibility.

P34: *"Those aren't long-term processes because the donors want to see the results and the products fast. It's very difficult to understand that this process of changing minds and behaviors needs more time, needs two, three, five years or permanent resources to be in those communities, once, twice."*

Thus, practitioners find themselves trying to support conflicting priorities—donor accountability and community trust. They bargain with donors for more time with communities and they "borrow against" existing stores of trust with communities by pushing to meet deadlines or external priorities, a dangerous practice that can wear away at the foundation of trust. Further complicating this dynamic is the issue of agency. Projects can proceed faster when they are designed and implemented from the top down, but it is the longer route—through community agency—that makes projects better suited to local needs, priorities, and capacities and therefore, suited to long-term positive outcomes.

There are times when funding becomes of primary importance for success, for example, when funding or delivery of goods is required for keeping promises[59]. When promises are

[58] Also discussed in Information-driven behavior #3: Keep Promises

[59] Information-driven behavior #3: Keep Promises

broken, so is trust, which erodes the foundation for long-term impact. Thus, when financial resources are necessary for keeping promises to the community, they are a top priority—because they are necessary for sustaining trust and therefore positive impact.

P88: *"If you are not keeping your promises, later on if you come to do your activities, they will say, 'No, we're no longer ready. We're tired because you promised this or that.' So that's why it's better to avoid, not to promise something that's beyond your means or that you are not able to do."*

Similarly, promises can be implicitly communicated. This is a risk to RCRC trust with communities in conducting disasters assessments:

P77: *"There have been cases when we go to conduct surveys in a time of disaster, and the community refuses because many people from other organizations who came and conducted investigation promised them some things and then left, while all they heard all the time from those people is just, 'investigation, investigation, investigation.' So finally, when [our society] goes to them, they are unreceptive."*

Community trust is eroded when they share time and information to meet with RCRC members, but the returning benefit is not readily seen.

Finally, the pinch of resources was felt when practitioners felt they could not adequately do the job of being responsive to meeting needs in basic ways or honor the RCRC principles of meeting, for example, the most vulnerable's needs. Multiple practitioners reported having to select communities for projects based on their already strong social fabric, or their previous success organizing for another project. Prioritizing resources based on community organization

level, may exclude the most vulnerable communities, where resilience is most needed but organization might be weak. Practitioners also discussed, for example, how distressing it is to lack stretchers to carry injured people and to fear hurting the very people they tried to help. Transportation constraints were a repeated pain point. Practitioners expressed frustration at delayed responses to communities in need when transportation to disaster sites was unavailable. As mentioned in previous sections, onsite presence is vital to relationship building, and transportation can enable or constrain practitioners' ability to not only be present with communities, but also meet their needs to participation at meetings or events. This is an important point because it is of great cost to the organization to lose strong practitioners who become disheartened by the inability to meet needs—which may be costlier than losing financial revenue because trained and trusted people are the most important resource for long-term success.

3. Success Factor 11. Structuring for the Long-Term

Practitioners exhibited a widespread learning perspective in their approach to information, recognizing communities as the primary source for learning. They valued **experiential learning** both for the communities and themselves, and **preserving** spaces necessary to experience learning and allow **adaptation**. For shared knowledge to have a long-term and widespread impact, it is important to have mechanism that are **structured for** this **flexibility.**

a) IDB 28. Experiential Learning

Successful practitioners learned successful ways of operating primarily by experience. Many practitioners credited their success in preparedness work to what they had learned from

their previous experiences in disaster response. While they greatly valued training, practitioners explained that it is in seeing what happens and working hands-on with communities where they learn how to deal with the complex dynamics of their work.

P42: *"You get education at school, but when you go out there to work with the communities, that is when you really learn. The places where I have worked are those who have provided me the tools, and it is through practice how we realize how things work and how they don't."*

Across countries, we observed an important role for organizations in recognizing the relevance of institutional memory to the sustainability of RCRC and its programs. In countries where practitioners are very well versed in their history of major disasters, the role of the government and RCRC of disaster and preparedness and the RCRC in the country, and the implications of that history for the work of the organization over time. In another country, managers are notable for a nurturing approach that helped the society maintain momentum. In one of the most advanced countries in terms of organizational learning and processes, learning is reified through constant iteration and organizational capacity-building initiatives. This is accomplished through lessons learned as well as research into volunteer and practitioner experiences. To draw out the same experiential knowledge from communities, practitioners used the VCA to help communities reflect upon their history, what they had experienced, and what they knew that could inform their actions moving forward. When teaching communities conceptual information like health information, strong practitioners took an experiential, participatory approach: for example, having community members create costumes to represent certain diseases and having a community event to share health information through a "fashion show."

Also important for long-term impact was teaching new skills to community members, rather than bringing in outside professionals, to do work such as building shelters. Equipped with new skills and confidence, community members are able to maintain their shelters, share knowledge with other community members, and use these skills in new ways as needs arise.

A key point to emphasize regarding experiential learning is that it is flexible and iterative: "learning by doing" allows for starting with an imperfect solution that can inform adaptation and the development of an improved approach. Like one practitioner who told us of her success in working to notify families of urged or dying during protests. It starts with a story of failure:

P47: *"We were only good in theory because we learned a lot of things, how to do what was needed and what to do, but we had no practice before, have tools and brochures from the ICRC, but not a real experience. At the beginning [of the crisis] we didn't know what to do, how to get contacts—help them locate their families. We got nervous and were very stressed and could not do it very quickly—but then got better "*

Then:

P47: *"With the help of our colleagues of ICRC. They have more experience and they could see how [to create a system]. I became involved with this team that had more experience. WE watched, how their team did it. The most helpful thing was doing it [for real], by doing it we had more practice work and we became quicker."*

And because experiential learning is participatory, it is necessarily holistic—that is, open to a wide range of community interests. Therefore, being able to be adept in supporting a wide range of needs is important.

b) IDB 29. Preserving Adaptation

Key to long-term impact is enabling community agency over time by preserving space for adaptation. In fact, adaptation is the culmination of the must-haves. As we have discussed, the four must-haves operate progressively, each one necessary for and leading into the next. Trust is the required foundation upon which to begin relationships. These relationships are the vehicle for bringing a community to operate in its own power, through organizing and then acting in agency. And preserving the space where agency manifests is essential for communities to continue operating in their own power.

Therefore, achieving long-term impact is rooted in preserving spaces where adaptation can occur. This begins with the understanding that adaption is needed not only at the beginning of a project but over time as needs and situations change, and is led by the community, as it is the expert on its own needs.

P109: *"It's not like the design at the beginning works every time, it should be changed with the need of the community and whatever findings are from the community."*

Countries known for strong preparedness created a space for preserving adaptation in different ways. For example, organizational leadership in one country talked about the importance of collaboratively creating project plans that are not prescriptive or restrictive but rather operate more like processes, and can structure how a community coordinates to take action according to the specific situation. Successful project plans are developed not only collaboratively but directed and adapted at local levels and shared up through the organization to the national level.

P93: "*We have a quarterly review where we review the annual plans in quarterly basis and discuss with the community people. But firstly, we will review in the community; then we have review in the district. Based on these reviews, we go to the national headquarter. Therefore, we address the community voice in each quarterly review. Community people also participate in this meeting. This is our working model/process*."

Another key to preserving agency was to work with communities to plan an initial approach to meeting community-identified needs using the resources currently available, with the expectation that as more resources became available or needs shifted, the work would iterate. In other words, key to preserving adaptation was expecting needs and resources to change over time and facilitating communities in developing a similar iterative mindset. This mindset informs structures built to formalize trusted spaces[60], where community committees and groups operate to meet changes in community needs over the long term: identifying needs over time and implementing strategies to meet those needs, including advocating for resources from local government.

Creating space for learning and adaptation is more intentional and active than simply **allowing** learning and adaptation, and it is not quite the same as **encouraging** learning and adaptation, which is likely to be top-down oriented (i.e., leadership advising those they supervise to learn and adapt). The idea of creating space for learning and adapting is to cultivate an environment in which knowledge is gained through experience; and agency leads adaptation; and

[60] Success-Drive Behavior #15 - Formalize Trusted Spaces

finally, in which the organization's mechanisms are formalized for dynamic, long-term engagement.

c) IDB 30. Structure for Flexibility

This recognition of the importance of constant learning and adaptation by the practitioner in the community is insufficient on its own to optimally support long-term success. Long-term success is realized through the support of policies, plans, agreements, organizational support systems processes and technology—that create a space for flexibility and adaptation over time.

P106: *"These are the organizational activities, right? Only having RC in the community is not sufficient. Organization support should be dynamic. For that purpose, we develop policy, plan and strategies related to the organizational [change and] development."*

In addition to supporting ongoing organizational learning through policies and plans, it is also important for everyday work to reflect a structure that is flexible according to community agency. In other words, official policies and day-to-day practice should allow for adapting work to local needs and sharing those adaptations across the organization. The respective roles of headquarters and local levels are distinct, but both were important: the local level leads adaptations for specific environments and conditions, and the headquarters shares what was learned across the organization. In other words, in countries known for strong preparedness, the role of headquarters is not to determine or approve the suitability of adaptations but to share across the organization what has been learned at the lowest level. For example, policies at the national level make available funding for "top-up" projects which are envisioned, planned, and carried forth by communities in partnership with local RCRC practitioners. In this way the

national society is structured to resource agency at the local level by encouraging the request of small amounts of funding for "top-up" projects

The above example also illustrates something we saw repetitively in our data: that to facilitate knowledge sharing, leadership must be responsive and accessible for suggestions, questions, and requests. Responsiveness was conveyed in several ways, such as intentionally creating both public and private spaces for questions. For example, one person in RC leadership said that he starts the day with a team-wide meeting where he encourages volunteers to raise questions or problems, which he tries to answer immediately during the meeting so that all can benefit from the exchange.

Other leaders were named for being easy to speak with at any time without fear. Others still, sought out team members one-on-one to check in with them and enable them to raise any questions they may not have felt comfortable asking in a more public setting.

In addition to structuring for flexibility within the society itself, strong practitioners said it is key for long-term impact to structure for flexibility beyond the organization. As discussed in Strengthening Social Fabric (SF5), an important value that RCRC offers in many locations is to serve as a mediator between parties that do not trust each other, for example, between community members and local government representatives. But lending trust to facilitate one-time collaboration is insufficient to support work over the long term. Thus, it is key to establish parameters, processes, or structures that sustain relationships for collaboration and partnership, spaces in which distrust is suspended and collaboration enabled.

E. Summing up the WSP

In sum, the information needed for practitioners to foster resilient behaviors to be adopted for the long-term—or "to take root"—is expressed via Community Agency. As such, practitioners' information practices ultimately all synergize toward this one central aim—that community agency is the pathway to sustainable resilience. Community Agency is where communities come to confidently act and advocate on their own behalf. Practitioners foster this through the use of strong interpersonal relationships, motivational methods and psychosocial skills. Equipped with participatory tools, and the time and space needed practitioners shepherd the expression of Agency through adaptation and collective action.

For community pathways to openly express their agency, practitioners build on current social networks to link and strengthen diverse stakeholders into an Organized Community. An Organized Community is a connected and aware community. Practitioners facilitate this through the use of sophisticated pedagogical, group facilitation and conflict resolutions skills as they walk alongside communities in the dialogical discovery of community knowledge, capacities and trust.

For practitioners to reinforce organization, they must first have Community Trust. That is, the ability to know the community and be known in the community. Trust requires sincere, motivated, culturally-competent workers with strong administrative, communication, and relationship building skills to be transparent, accessible and present within communities. Building trusting relationships with communities creates the foundation of all the information needs and MHs identified in the wheel of successful practice.

Ultimately, successful practitioners' information practices are all aimed at optimizing their work to more effectively reflect the community's own knowledge back to them for discovery and action. Thus, successful practitioners' primary information needs rest in the capacities and resources needed to effectively support their IBDs (1) to build trusting, transparent and mutal relationships with communities; (2) to manage, administer and facilitate community ownership, voice and dialogue (3) to motivate, learn, iterate and adapt programs with local and peer communities; and (4) with wider organizational awareness on the impacts of organizational decision-making on IBDs, and better mechanisms to do so within the delivery of programs.

V. DISCUSSION

This study and analysis, in revealing hidden elements of work within the humanitarian domain, brings from the "shadows" into the light shared implicit behaviors of successful humanitarian field practitioners. The findings tell us that more effective ICT design for supporting humanitarian field-work will need to focus on supporting **social discourse and agency**. This poses significant challenges for researchers, developers and designers aspiring to the creation of effective HICT, and ICT4D.

The WSP challenges technology designers and researchers to shift ICT's typical view of information as predefined data primarily for accommodating the information needs to supporting functions of headquarters to a view of information as a social phenomenon. It opens and urges new avenues of research for socio-technologists in general, calling for a shift away from legacy methods in design and development, and legacy paradigms of work in favor of innovations in HCD and the sociomaterial.

A. The WSP – A Theory of Humanitarian Information Practices Centered on Achieving Social Agency

The information needed for practitioners to foster resilient behaviors to be adopted for the long-term is expressed via Community Agency. The WSP framework presents a grounded theory of the relevant goals, behaviors, and decision-making in both work-practice and information practice needed to guide effective design of HICT for achieving long-term impact via a catalyzation of social agency with local communities. Humanitarians information practices represented in the WSP provides a detailed guide for future humanitarian ICT design. By

focusing on these pathways for how critical information manifests, some key strategic targets for supporting ICT design emerge:

1. Social Agency is the most critical information need for Long-term Impact

When communities can make and act upon their own decisions (i.e., when they have agency), they are equipped to respond to changing circumstances, challenges, and environments. Honoring and accommodating community ownership of decisions, solutions, plans and any technologically captured information is a central design principle for humanitarian ICT.

Creating experiences of agency and success roots the potential for long-term success of actual community-driven projects and collective visualization. This calls for greater development of practical ICT that supports collective visualization. In addition, it requires a necessary awareness to overly complex technology that could hamper participation and agency if the tool is not compatible with the local level of common use.

2. Relationships are the primary pathway for critical information

The results show that critical information is revealed in the multi-directional interaction of relationships and communication. Contrary to the bulk of current efforts, this suggests basic ICT design should provide for more free multi-directional flow between communities and practitioners.

Practitioners are the face of the humanitarian organization within the community. The perceived genuineness and transparency of the practitioner influences trust and affects the credibility of the organization. Practitioners must be sincere in their motivations, and able to relate to others not based in transactional interactions or on meeting a goal, but grounded in

sincere care for others. This must be transparent to those they serve and so must the technology that serves them. It is their time with the community as well as their ability to keep their word that makes or breaks community trust. The extraordinary individual effort builds and strengthens an organization's credibility, and requires ICT design that can recognize and value these efforts and connections within its design.

3. Trusted Spaces are critical information spaces

Individuals are motivated to participate in a variety of ways, and practitioners require autonomy, various motivational tools and techniques for collaboration for amplifying community dialogue, and the necessary time and space to effectively enact them. Humanitarian organizations and design of HICT must recognize, protect and nurture a sense of belonging and mutuality. Practitioner skill is not only technical, but it is full of attributes compatible for "belonging to the community"—and so must be the technology that supports it.

One-on-one and house-to-house visits, as well as training and planning meetings, provide individual interactions that are just as important for practitioners to assess approach and direction in implementation, gain participation, and foster belonging as they are for assessing sectoral needs. Approaches and technology "solutions" which reduce interpersonal interactions may have negative effects on engaging will and advancing community agency.

Systems would benefit to include incentives and evaluations for trust investment, such as encouraging and monitoring more time and connection with and for communities, or evaluations of community perceptions on practitioner's availability, responsiveness to individual needs.

Practitioners and the technology they use must have the ability to support mutuality of information exchange, as well as the sharing of responsibilities and authority roles in the field.

4. Reflective, Interactive Pedagogical Methods Facilitate Discovery of Critical Information

Practitioners' facilitation skills, co-learning attitudes, and promotion of dialogue and others' leadership is central to supporting social agency. This calls for measures, tools and incentives that support transparency and uphold spaces for ownership to emerge. For example, are organizational systems cultivating belonging? Are they inviting leadership and learning at the community level? Are they providing the flexibility to allow communities to influence and design program plans?

5. Adaptation Manifests Critical Information

Our study suggests that success is intimately linked to the malleability for technological tools to adapt to community-driven plans, practices and outcomes. The need for this flexibility suggests large-scale replication for success must focus on process solutions vs specific outcomes, and empower communities with the time, tools and systems that accommodate adaptation.

For practitioners to be responsive to community needs, and support their initiatives, they must work with some degree of autonomy and be open to ongoing change and adaptation. For example, this may mean building into planning processes—and the technology that supports it—steps for review and community-driven adaptation at various points throughout the life of a project. It also means building flexibility for adaptation into not only plans but also funding. There is a need for technology to recognize the and integrate the norms of day-to-day

humanitarian practice in which actors at the local level drive adaptations, while actors at the headquarters strive to share/distribute what has been learned across practitioners. It is the pivotal action for creating sustainable solutions. This has implications for scaling up and sustainment of programs and technology.

Practitioners adaptability includes the ability to nurture cultural competency within attitudes, approach, and the specific ways they speak (e.g. training in listening and non-verbal communication). The research accentuates a dearth of resourcing for administrative work, and need for flexible tools to accommodate local meaning and articulation. Practical and adaptable ICT tools and templates for supporting transparent ways of operating (e.g. use of language, writing and use of computer applications, collaborative paper-based solutions, or copying capacity) are needed. Likewise, practitioners can be better supported with highly adaptable designs flexible enough to allow tailoring to local languages and contexts, and the meeting of individual needs.

B. Shifting the Parameters of "Information" for Humanitarian ICT Design

When we asked practitioners about success and failure and about the information that supported these outcomes they didn't tell us stories about data. They told us stories about their **human, relational and pedagogical interactions**. In summary, our study did not reveal the expected results of primary information needs for specific outside technical knowledge or technological capacities. Rather, across a broad spectrum, training and resources to support effective relationship, facilitation and pedagogy are needed over technical sectoral information and tools, and even, at times, over financial needs. These findings suggest that the overall challenge of humanitarian organizational and informational systems are to evolve to better

recognize, preserve, and improve the often hidden and complex multi-directional social interactions within comunities and between communities and the practitioner. The relational field practices of working with communities are their most critical information practices.

Therefore we have ventured into the foray of bridging social interactions and technology design through the lens of information "requirements." In the words of Ackerman, the WSP provides the humanitarian specific **socio-** or "what we know we must support socially" so that technology designers can better pursue the **–technical** or "what we can support technically" for HICT.

From this approach both socio-technical gaps and pathways in design methods become more apparent. In particular, the Wheel of Successful Practice (WSP) reveals a need for a shift in the view of information from: **what particular information is passed** to: **how it is obtained, and for whom's decision-making**.

In other words, rather than information viewed as pre-defined "data" for collection or a fixed representation (i.e. the what), more critical in HICT design is information as a relational interaction and shared expression (i.e. how it is obtained). However, practitioners' interaction with communities, as we have stated, is not actually per se "information work" as we usually think of it in technology design in terms of having fixed, predefined parameters.

Framing practitioner interactions in the field according to "information" practices provides us not only a specific case-study and theoretical framework to design differently for humanitarians, but also: a possible framework from which we might also begin to explore new design approaches for bridging the remaining socio-technical gap between technology design and development methods and the complex, dynamic and holistic needs of a social system.

1. "Information" as social phenomena over fixed representations

Practitioners reflected the most critical "information" needed for successful outcomes is **the implicit and shared knowledge of communities personally and relationally expressed within trusted spaces.** When we asked practitioners about the information or lack of information that mattered in the context of their stories of success and failure, they identified relational and pedagogical interactions with communities and between community members. These findings conflict with the fixed data-oriented resources normally used in humanitarian ICT design such as sectoral technical methods, data repositories, websites or mobile applications expected—be it from IFRC, their nations, or publicly available for-profit innovations. It moves an emphasis from static, broadcasted information to an open dynamic engagement facilitating social expression and decision-making (i.e. undefined inputs and outputs).

2. Information for the purpose of social decision-making vs organizational or individual decisions.

Practitioners revealed that this critical information required for supporting their successful outcomes resides within communities, and **is accessed and used by the community, for the community, according to the community** (a.k.a. decision-making and action of and by affected communities)—not the internal organization. Further, practitioners' concerns were not for more technology tools to support RCRC organizational analysis, decision-making and action. They are not seeking tech support for analyzing distinct types of collected data from communities (e.g. definable inputs such as household or geographic assessment data) from which distinct inputs and outputs (or functionalities in technology) could be derived or organizational decisions could be made. While some helpful information and tools of that nature were named,

practitioners largely rejected those sources as the primary type of information they needed for success.

This presents a shift of the "for whom" of design intention away from primarily informing headquarters or the organization as decision-maker, to information expressed and owned by communities for their decision-making. Under this new horizon, current initiatives that focus on tools for gathering information for the "headquarters" become secondary. Instead, it identifies a need for the locus of technology function to shift to toward the information needs of facilitating communities in their decision-making. Information passed down from above and information collected in the field to fill reports or spreadsheets to be passed up to headquarters vacates the central position.

With most tech initiatives currently focused on HQ needs for fundraising and reporting, an innovation opportunity to improve humanitarian ICT support by shifting design focus to the practitioner-community and community-community communication and information use.

3. Theorizing work practices as information practices

Because when we asked practitioners about the information or lack of information that mattered in the context of these stories, they told us about their **core-work, practitioners' primary information needs are work-practice needs.** Thus, the wheel presents a much more robust and situated picture of aims and behaviors enacting successful field-practice, in general. As our shift in ICT design moves to accommodate relational and pedagogical interactions and the socially expressed information for the community, by the community, according to the community, as does accountability of ICT. A shift in perspective for what we might normally

consider "information requirements" for ICT in both form (i.e. process vs output) and to whom it serves (i.e. decisions of affected communities vs the organization) expands the accountability of design to the work-system.

This dual nature of the wheel as both the core field-practice and information practice, in turn, allows us to see the central need for ICT to not only account for whether the engineering is sound, but also whether it is accountable to the practice.

C. Shifting Design to the Practice / Myths About Generalizability:

The WSP's revelations about the "socio-" requirements of ICT advance us to a more nuanced conversation about *"what we can support technically,"* (Ackerman, 2000). By asking what is required to technologically support practitioners in accomplishing the IDBs within the WSP, technical barriers and shortfalls to accommodating social agency can be seen more prominently. As Chapter II outlined, embedded in basic technological capacities are a history of "black-boxed" value assumptions for the work-systems for which they were originally engineered. Some methods that have long considered generalizable for creating technology in the humanitarian work-system, in fact, are not. This extends Suchman's observations that "errors" in representation are perpetuated not only by (1) the researcher's or designer's own hidden value assumptions or (2) those of the chosen stakeholders' views designers/researchers recognize in their perspectives of how effective work is accomplished, but also through (3) common technology design and development methods created for a specific type of work-system. That is, we perpetuate Chambers "transfer of reality" of a market-based system (for example) into humanitarian ICT via Suchman's "errors in representation" through Latour's

"Black-boxes" embedded in many of our most basic ICT design and development methods. (Suchman, 1995; Chambers, 1997; Latour, Science in Action, 1987).

1. Organizational Design Errors – Revisiting Chambers

It makes sense that we have not previously developed a socio- accountability mechanism when we consider its roots in commercial and military work-systems when we consider they share similar socio- models. (1) closed/controlled[61] system attributes with (2) top-down decision-making and (3) task-based functionality, for example, are standardized into ICT design and development methods. The findings suggest humanitarian "headquarters" organizational structures and thus, the technology designed to support them, while ideal for meeting the mission of closed-system information needs, are not ideal for meeting the work-system needs for humanitarian successes.

As illustrated below, the information and communication technology of a closed system (e.g. typical for-profit or military organizations) are generally designed to inform and support a small group of decision-makers positioned at the top of the organization who have the best perspective to make decisions and direct support of what is often a dispersed network of workers at the bottom (whose perspectives encompasses only a piece of the whole picture). Guided by top-level decision-makers, the work of the network then supports the established big picture strategy.

[61] See Section II.C.2. P 36-38

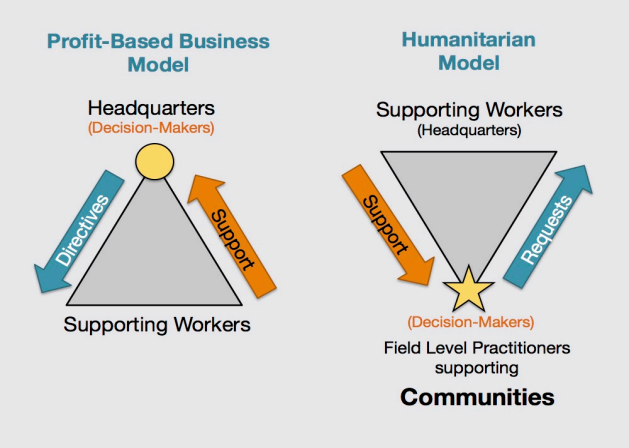

Fig. 19. Contradistinctive Decision-Making Models Between Humanitarian and Profit-Based Work-Systems

However, for the humanitarian work-system, the triangle is inverted. There exists a small group of practitioners with the best perspective of the situation dispersed in the field, who are making decisions for the directions that will be taken with affected communities and sending requests for support to headquarters and donors at the top. In this case the dispersed network of supporting workers whose perspective encompasses only pieces of the full picture are the "headquarters". In contrast to top-down models, headquarters' efforts support (rather than direct) the decisions made by field-level practitioners with affected communities[62] (Figure 19). Using terms such as "headquarters" to name functions that do not oversee and direct the decision-making of core operations in the field is misleading to not only designers, but also members of the organization.

This aligns with Chambers earlier observations revealing the symptoms of Latour's black-boxes, i.e. work-system conflicts between field and HQ via the "reality-transfer" of

[62] From my co-authored paper: Walton, R., Mays, R., & Haselkorn, M. (2016). How humanitarian culture informs change adoption: A case study of humanitarian logistics. In N. Altay, M. Haselkorn, and C. Zobel (Eds.), *Advances in managing humanitarian operations* (pp. 135-157). Heidelberg: Springer.

technology design. When organizational support systems and their supporting technology systems do not recognize and reinforce the power of lowest-level decision-makers, they do not support successful humanitarian work but rather contribute to a pattern of failures in achieving work-system progress or "errors in development."

Further, these findings reinforce Chambers view that organizational models within development and relief agencies (primarily derived from commerce business practices) collide with the practice that creates success in improving the lives of the poor in through the application of technology. The results affirm his statement we shared earlier summarizing the conflict as: "*In normal bureaucracy, central authorities simplify, control and standardize. In normal, top-down, centre–outwards development new technology is developed in central places by uppers and transferred to peripheral lowers. The resulting 'Model-T' standard [technology] packages often misfit diverse and unpredictable local conditions.*[63]" Contradistinctive from common bird's eye view decision-making, the central decision-making in achieving humanitarian aims operates bottom-up with field practitioners on the ground driving the direction of work.

This research moves beyond untangling the consequences of "reality-transfer" and "errors in development" passed down via technology to providing a framework for better guiding ICT design to support the needs and context of humanitarian field-practices. In so doing, it also reveals much more specificity of the misalignments contracted when humanitarian agencies have borrowed and built organizational structures stemming from other types of work. The findings of this study, specifically, raise questions as to the "effectiveness" of generalizing top-down

[63] Chambers ibid p40

organizational designs for supporting the critical field practices that determine humanitarian success.

2. Rethinking the "Requirements" Document

The requirements document (RD), born out of traditional engineering, is inadequate for determining the effectiveness of humanitarian ICT. It accounts for the **–technical** (or engineering) part of system design, but neglects accountability to the **socio-**. For example, where the WSP identifies Mutuality as a success factor and supporting IDBs emphasize information transparency—which is also central to maintaining Trust with communities. When in a non-computer literate community requiring Mutuality for successful outcomes, an accountability to sound computer engineering, functions and features will not assure that the socio-technical design is sound.

As mentioned in the background section, critical theorist Feenberg emphasizes an existing bias present through the interpretation of a social requirement into a technical specification, defined as technical codes, but which carry the values of the dominant technical actors (Feenberg 1991). With the requirements document as the primary contractual agreement between the customer and a software designer for delivery of the technical specifications of a product, is it no wonder technology has struggled to meet **socio-** accountability?

Especially when you consider the frequent aims of technology makers to replace human work—the consequences for the humanitarian mission are upon the well-being of people's lives. While humanitarian organizations have obligated to honor human rights and humanitarian law in the way they operate, the same has not yet been required of the technology designed to support

it. While this dissertation attests to the decades of willingness and pursuit of both technologists and humanitarians **to get technology into the humanitarian mission, I assert that what we actually need is to get the humanitarian mission into technology**—for which the WSP reveals a way forward.

3. Example: OpenDataToolkit (ODK)

I demonstrated earlier in this discussion the shortfalls of the requirements document (RD) to account for the *socio-* need of humanitarian information practices identified via the WSP. ODK presents an example where the RD can inhibit even the most cutting-edge technology from accommodating social-agency. ODK is a software technology that allows data collection for the purposes of determining resourcing needs for disaster or poverty affected persons on a handheld device. Its progress and aims were shared with us as part of this study as a hopeful tool for use by RCRC, however as successful practitioners were sharing what mattered for their success, we could already see how this new tool threatened their success.

The intent is that data obtained via ODK could be collected and shared more easily in order to more rapidly create resourcing strategy for affected persons in disasters. At the time of our study (ODK 1.0), practitioners could choose from predefined fields for constructing household surveys. The data can then be collected and input directly into the device—with each affected person, specifically without the burdensome house-to-house and face-to-face meetings. This is likely to improve speed of collection, however, through the WSP we can better assess how that might risk removing key practices for the establishment of MH1- Trust. Successful practitioners emphasized that for a resourcing strategy to bring sustainable resiliency, reporting of accurate needs emerge out of trusted relationships achieved via house-to-house or face-to-face

interactions. These practitioners specifically named the use of handheld phones as barriers to achieving authentic expression of need from beneficiaries. Thus, assessed against the WSP, a design solution for data collection that eliminates these spaces could be called into deeper nuance. It's possible conflict with a number of IDBs include where practitioners actually avoided the use of smartphones because it created possible obstacles to (a) "Being Part of the Community"— and practitioners found fixed surveys and data entry inhibited their need to be able to (b) "Speak with Cultural Competency"— as well as (c) promote "Adaptation as Agency" where the most critical information is expressed. These demonstrate "errors in representation" that are not currently assessed nor evaluated within the RD where the accountability resides with the engineering of a function and feature for collecting a particular standardized data input. By many accounts, ODK has excelled compared to other technologies in accommodating practitioners needs, but via the WSP a greater range of shortfalls are brought forward.

4. UCD Limitations for Social Agency

As we discussed in the background, User-Centered Design (UCD) is a more complex and innovative methodological example of the encoded assumptions that serve as barriers to provide technically what is required to support the IDBs of the WSP. Revisiting our dissection of Fogg's 8-step model ((Fogg, 2009); Figure 7, page 67), reveals methodological detachments from social-agency even on the forefront of innovation for behavior change[64] that is fundamentally flawed from accommodating social-agency. In Fogg's design model—although it directly

[64] While persuasive technologies methods are controversial due to its approbation to covert influence, this observation addresses the technological capacity to accommodate social behavior or even feign a sense of ownership regardless of its transparency.

addresses behavior change—we can also see where UCD falls short of enabling a social system with direct **agency**. In Fogg's 8-step approach, agency is distinctly missing. Steps 1 to 4 discuss researching the ideal target behavior, finding out about the audience, identifying barriers and the right technology channel based on information about the users and target behavior. However, step 5 (identify persuasive technology examples) and step 6 (imitate successful examples) assume that the decisions for design are primarily made by the designers and developers of the technology. Although these decisions are tested in step 7 (iterate), but without a direct feed from the participants. With lack of agency in the process of design, the level of participation from the target audience is low which may lead to the designers focusing on an irrelevant problem. This example demonstrates how UCD strategies for impacting behavior are left predominantly isolated not only from holistic iteration but also *social* iteration.

Absent of a pathway to incorporate social agency within the process, these approaches are unable to accommodate the information needs of humanitarians. In Bertalanffy's model, they do not bridge the pillars of the wider domains (Bertalanffy's first pillar) to the differing ontologies, epistemologies and values (Bertlanffy's third pillar - "systems philosophy") of the humanitarian domain and their practices (i.e. the IDBs of the WSP). Yet, to close the sociotechnical gap in the humanitarian domain, it necessarily demands of technology a support structure with commitment and priority of the humanitarian values intentionally applied in every aspect of design. This research advocates for a social accountability of HICT exigent to humanitarian missions—that technology design must be able to assess, acknowledge and transform methods that resist the inclusion of social values into technology.

D. Bridging the Socio-Technical & Accountability Gaps

The recent embracing of HCD by humanitarian actors offers an opportunity for accelerated learning for how we might newly approach design for development and relief in light of the WSP. Where socio-technical scientists have progressed, the methods can be especially seen in design approaches for human-centered systems (HCSs). While versions of HCD using usability design strategies for impacting behavior find themselves isolated from both socially and technologically holistic iteration, Kling and Starr's HCD addresses the reality that "*People are not stand-alone organisms—we are quintessentially social and collective, not just individuals—or individuals in a diffuse social world,*" (Kling & Star, 1998). Burgeoning work in this area sketches principles for widening the boundaries of the problem-space across Bertalanffy's three pillars. Returning to principles presented by Kling and Starr, where **HCD is the design of a socio-technical system (STS) for enhancing people-driven work,** researchers are finding methodological pathways for bridging the moral or values dimension of Bertalanfry's General Systems Theory with the technological dimension, and thereby, constructing pathways to social agency.

The findings embolden pathways for accountability to the socio- of the humanitarian human-centered system in two ways: (1) via the participation of field-practitioners themselves within a holistic and participatory HCD design process, and (2) via the transformation of design and developments methods assessment against the information practices of the successful humanitarian work-system, i.e.—the framework of the WSP.

Theoretical and methodological influences cited by socio-technical scientists in designing for social agency include of Critical Theory (Feenberg, Critical Theory of Technology, 1991)

Participatory Design (Bjerknes & Bratteteig, 1995), Value-Sensitive Design (Friedman, Kahn, & Borning, Value Sensitive Design and Information Systems, 2009) and Feminist Theory (Bardzell & Bardzell, 2015). Critical-cultural perspectives of technology (Feenberg, Critical Theory of Technology, 1991) attest for material aspects of technology and implications for affecting greater social systems, cultures or balances of power. Such perspectives express (even if only tacitly) the need for flexibility in the materiality of technology to also accommodate, lowest-level innovation.

1. Humanitarian Accountability Via Holistic & Hyper-Participatory Design

When addressing social problem-spaces like WSP, designers use of hyper-participatory and critical design methods are affording more holistic and human-agency[65] solutions. These innovative approaches better address the reality that technical solutions are part of a larger social system that requires holistic design. Shared among these theorist and HCS designers are the use of highly participatory methods which incorporate the humans who are the members of the work system into design decision-making at every level. This includes members from the very beginning of the typical discover-define-design-develop process to include defining the problem and the solution, all the way through assessment.

Participatory methods do not only usher in social agency to design, but also usher in an accountability to humanitarian values (i.e. the broader work-system). In humanitarian and development work, participation fills a gap for that critical knowledge of nuance, while embedding some accountability into the design of program. This can be illustrated via the

[65] Human agency: that humans are relatively free to enact technologies in ways they choose (Boudreau & Robey, 2005)

successful practitioners' realization of the human right to self-determination via the Must-Have of Community Agency. As one of the humanitarian mission's accountability principles it guides the humanitarian work-system via code of conduct #7:

> **7. Ways shall be found to involve programme beneficiaries in the management of relief aid**
>
> Disaster response assistance should never be imposed upon the beneficiaries. Effective relief and lasting rehabilitation can best be achieved where the intended beneficiaries are involved in the design, management and implementation of the assistance programme. We will strive to achieve full community participation in our relief and rehabilitation programmes. (ICRC, 2004)

Participation is a positive way to create accountability to the people within the social-system on throughout the process. However, participation minimized to another's intrepretation or "designing for" diminishes accountability---participants put at the wheel to guide the design will produce a design more accountability to their practice. Chambers has led in the advancement and advocacy of participatory methods in development and humanitarian work, which has brought an accountability to "*local/field conditions and individual, group, and community realities*" (Chambers, 2008). Thus, participatory methods have realized much of dialogical theory that Freire first introduced—that is that dialogue, praxis and reflection are the way to societal transformation (Freire, 1970). Freire asserted it this way "*the dialogical theory of action does not involve a Subject who dominates by virture of conquest, and a dominated object. Instead, there are Subjects who meet to name the new world order to transform it*" (1970, p. xx). Via dialogue, or participation, the system is accountable to their world order. This relates to the heart of the aims of humanitarian resilience work, where organizations ultimately seek to see communities transform out of poverty and into wellness.

It would only make sense that for technology to support transformation of communities, it must also be able to afford the same participation in decision-making required in the core-work. Below I share examples of two sociotechnical scientists whose work and methods represent holistic and participatory human-centered design of technology.

Examples of Holistic, Hyper-Participatory HCD - Wong and LeDantec

- Wong-Parodi developed an interactive analytical decision support tool for energy policy on the Navajo Nation. She involved the citizens essentially, making them co-creators of the technology and allowing them a sense authority in the process. She emphasizes the importance of having social negotiation from the beginning—particularly the formation stages. "*Facilitating informed decisions about climate- and energy-related policies requires us to understand the facts of those choices."* She employed a range of multiple participatory methods—interviews, exercises, role play, question about value. In this way cultural meaning for what mattered and how it was needed could be embedded. "*By determining how cultural values relate to energy use and impacts, we can better understand how these perspectives inform preferences about energy resources and thus hopefully develop technical tools more reflective of the decision makers and stakeholders they hope to inform*." Further, issues that would not be found via more formal methods emerged such as concerns "*over privacy, health effects and unfair electricity bills."* Uniquely, she found Navaho participants "*placed significant importance on environmental preservation, not only for the viability of future generations, but also for transmission of culture and identity that supports stewardship of the environment.*" Thus, the design for the tool will contextualize outcomes of energy resource development not

only in terms of their energy and economic benefits, but of more central importance to them—it will also assess environmental impacts, and consequences for cultural resources (Necefer, Wong-Parodi, Jaramillo, & Amall, 2015).

- A second example is that of Christopher Le Dantec, who has used multiple methods to increase what he calls "*social creation in design*" (Le Dantec, 2010). He explores designer as social member in a collaborative endeavor and emphasizes dialogue and conversation as key methods for the integration of environment and culture into more appropriate design. For example, when working with homeless communities he engaged both caseworkers and the homeless population in dialogue to participate in strategy and planning of what the technology should do (Le Dantec and Edwards, 2008a, 2008b, 2010). He explicitly allocated space and voice to non-traditional members in design (the homeless community) vs the staff, resulting in joint participation and co-creation.

2. Sociomateriality Theory as an Applied Method for Social Agency

The WSP brings forward a valuable case-study framework for developing more aware and effective methods for materializing social agency more generally. In its detailed mapping of a socio- phenomena as an information requirement, there exists tangible knowns about social phenomena for HICT design. We have already highlighted examples ranging from dialogue, to face-to-face interaction, to information transparency.

To meet this new knowledge in design, we are fortunate that Orlinkowski's view of sociomateriality isn't one way. Rather than the socio- being solely the subject of the -material, or -material the subject of the socio-, she posits that they are inseparably linked in a dance of dynamically co-creating and redefining each other (2007). Some STS researchers , in recognition

of this dance—and the malleability of some "**materials**" to be reshaped or co-opted by the **socio-** for other uses or meaning—are beginning to explore the creation of sociomaterial methods that might be used to more intentionally allow the socio- to shape the material. These methods are addressing the stinted iteration exposed via the example of Fogg's 8-steps (Fogg, 2009)—an overlooked divide between "design" and "development." There is recurring problem that some things that are "hardcoded" into a design create barriers to iterative "discovery" after the "develop" step has passed (discover-define-design-develop model).

Examples by Drouhard and Linjse demonstrate exploratory methods that can incorporate the social—in this case distributed knowledge, shared meaning, and the dynamic nature of these—into the "backend"—or what has traditionally been situated as a fixed platform that limits holistic iteration between "the hardware and software of thing" (Bertalanffy, 1968)

Examples of Sociomaterial Methods: Drouhard and Linjse

Drouhard and Linjse demonstrate innovation at the deeper "engineering" phase (a.k.a - development) to introduce greater malleability of the "material" to accommodate social activity. Their exploratory methods seek to incorporate the social—in this case distributed knowledge, shared meaning, and the dynamic nature of these—into the "backend." —or what has traditionally been situated as a fixed platform that limits holistic iteration between "the hardware and software of thing" (Bertalanffy, 1968). Both examples are also addressing the stinted iteration exposed via the example of Fogg's 8-steps (Fogg, 2009)—the overlooked divide between "design" and "development."

- Drouhard seeks to utilize "exploratory visualizations" as a component of participatory method. Her work is influenced by the view that "We should note, also, that while our

primary focus is on visualization design and the related issues of interaction and display, our feminist approach requires that we expand the design frame so as to account for the range of social forces and material conditions that influence the design process. In other words, a feminist approach to data visualization, while centered on design, insists that data, design, and community of use, are inextricably intertwined" (D'Ignazio and Klein, 2016).

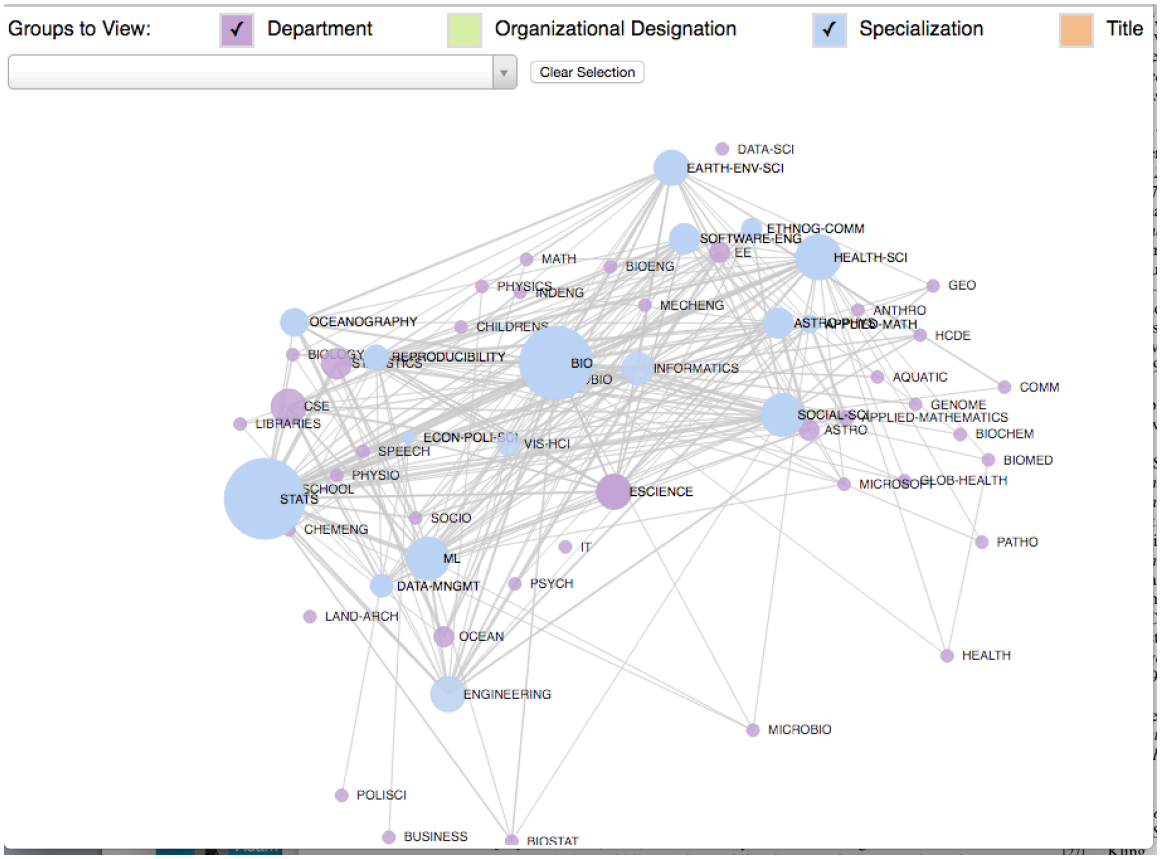

Fig. 20. Screenshot of Drouhard's Interactive Visualizations

Drouhard's work builds on an established example of malleable-in-the-material we use regularly in design and engineering—that of "boundary objects." Via participatory workshops, in her work with a community of data scientists, members associated meaning

and value in terms used to refer to their networks and identity. The resulting interactive visualization (Fig 10) was helpful for seeing meaningful associations within their network. As participants continued to identify associations in their networks, the visualizationscould adapt to reflect to the use of their own ontologies. (Drouhard & Fiore-Gartland, 2017)

- Lijnse has made strides in merging the design-development divide via the development of a programming language that represents an ontology of the practitioner. In his work with military watch officers at 24-hour command centers, he observed a need for less pre-coded tasks within the supporting ICT. Given the unlimited number of variables of incidents, players and actions that can be taken in emergency situations—there is only a small amount of repeated processes that would benefit from a highly specified, hard-coding or algorithm. He recognized the need for very simple coding with open-ended options that would allow the watch officers to dictate what the next task should be. To be fast and efficient in unpredictable environments, practitioners needed to be able to move in unforeseen ways and as such in some environments require *less* pre-designed constraints on information formats and ways of flowing. From this realization he created a coding language that uses the ontology of the practitioner vs traditional backend language of computer function. Through this approach he successfully blurs the roles of developer and designer, merging those functions and creating holistic and adaptable pathways for accommodating change (Lijnse, 2014).

The examples of Drouhard and Lonjse's dynamic platforms bridging participation of stakeholders into the deeper levels of technology development present new and promising routes

for technological accountability to work-systems accountable to broader sets of values and ontologies. This research emphasizes the need for greater innovations such as Drouhard and Linjse offer in participatory platforms to bring forward social agency into the material. My research builds on Orlikowski's call to view organizational systems as sociomaterial, where "what is sociomaterial is not the technology, but the "practice" in which the technology is embedded." It promotes going further: innovating sociomaterial methods that can allow for the social defining of designs to better support community constructed meanings and practices for the future. Humanitarian practice is in need of technical systems that can acknowledge that technology is not the innovation, but instead accommodates the innovation of the practitioner.

VI. Conclusion

The WSP names the specific criteria of "successful" for humanitarian's core field-work and the information practices that support it. In sum, successful humanitarian outcomes are centrally dependent upon the realization of social agency. First, long-term impact of humanitarian interventions in communities is achieved through the development and expression of social agency. Second, the critical information for achieving long-term impact is created and expressed through social agency within community and community–practitioner dialogue and social interactions.

The WSP also sheds light on fundamental misalignments in current organizational design and technology designed to support it. Closing the socio-technical gap between technology and successful humanitarian field-work implicates shortfalls in current technology design and development methods—and ways of assessing their effectiveness. If future HICT efforts aim to

increase successful outcomes for humanitarian values, then humanitarian organizations and technological support systems must evolve to accommodate social agency.

A. The Big Shift

Humanitarian organizations who seek to provide humanitarian services and resources to vulnerable populations require an organizational design shift to center their structure and processes around the core field-work of successful practitioners. To do this, they must first come to better understand successful practice and the practitioner's needs for achieving long-term, self-sustaining resilience within communities. Second, they must shift the focus of organizational and technological support to the information needs of the field practitioner. This shift requires a recognition of the community as the executive decision-maker and the field practitioner as the highly skilled interpreter and visionary for outcomes. Humanitarian agencies and academic researchers might benefit from exploring alternative models of leadership, ontologies and organizational structure with more bottom-up, organically developed, or democratic characteristics.

Technology designers who wish to support this work require the same understanding. In addition, they must shift current methods to accommodate social agency as the central position within design. This requires a recognition that dominant theories and methods for technology design evolved under another value-system. As such, foundational and traditional ways of building technology that we have long considered as generalizable for ICT, in fact, are not. It requires separation of the designer as decider and instead as facilitator. The shift calls for the development of more holistic, hyper-participatory methods and avenues of assessment that can account for design's impact on the larger work-system and its commitment to the humanitarian

mission—which is the thrust of HCD. The shift suggests a need to develop more sociomaterial methods and platforms that allow for social agency as part of ICT design.

B. Social Agency — A New Frontier for Digital Design

The WSP ultimately exposes a central HICT requirement of social agency for communities to be served successfully according to the guiding principles of the humanitarian imperative or human rights law. Current technical accountability as to whether ICT engineering works as promised to a certain standard, although important, is actually secondary to the need of whether it works for the larger mission. What is the cumulating cost of precious hours and funds spent to perfect the engineering of a system that is not able to do the "real-work" of the humanitarian mission? Traditional economics and commerce models—and the technology design and development methods that carry their black-boxes— are simply not crafted to accommodate social agency. This conflict is foundational although often unstated. We can do more to innovate methods at the core levels—from design to assessment—to address this gap of accountability. This research introduces specifics that, if integrated into ICT assessment, offer to bring new insights about the "black-boxes" present in methods limiting the ability to achieve more successful designs for the humanitarian work-system. This research echos and heightens the call for more avenues to be explored at the deeper "engineering" phase (aka -development) to introduce greater malleability of ICT for accommodating the need to empower lowest-level innovation and social agency.

This model of successful practice offers not only a guide for the design and development of new frameworks and methods for humanitarian ICT, but also hopefully for helping technology designers to advance participatory and sociomaterial methods for accommodating social agency

in design more generally. The WSP provides a detailed framework viewing social agency as an information practice. From this approach technological routes and gaps in designing for social agency become more apparent. Thus, framing practitioner interactions in the field according to "information" provides us not only a theoretical framework to design ICT differently for humanitarians, but also a possible framework from which we might begin to explore new design approaches for bridging the socio-technical gap between technology design/development methods and the complex, dynamic, and holistic needs of a socially-driven system.

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