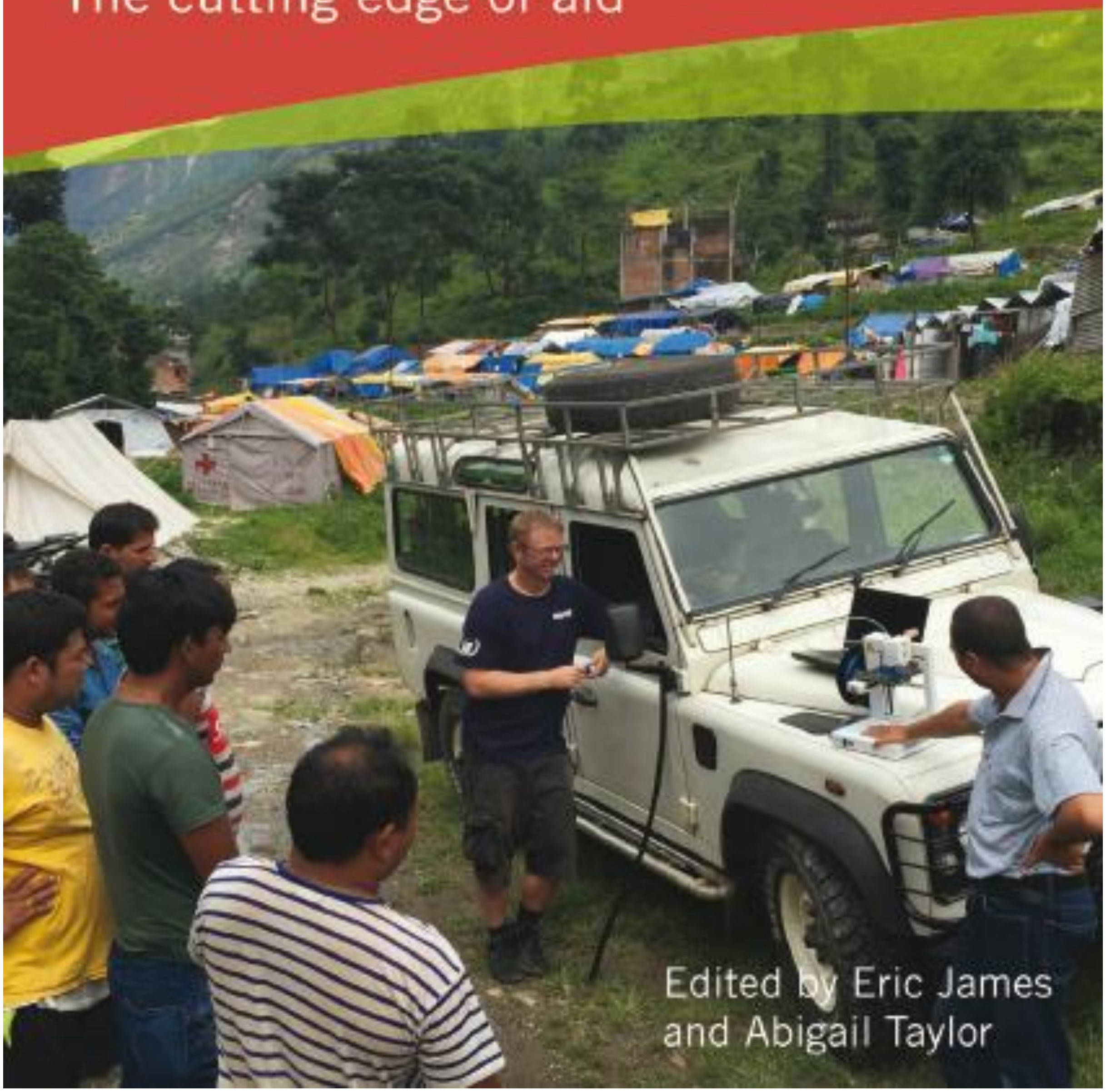
Managing Humanitarian Innovation

The cutting edge of aid



Edited by Eric James and Abigail Taylor

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PRACTICAL ACTION Publishing

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Managing Humanitarian Innovation presents a new approach to transform the way humanitarian logistics are conducted. Innovation in logistics includes disrupting and improving supply chains through the use of technology and engaging people to manage this approach. The book discusses what innovation is, and strategies for supporting it; it describes practical innovations and how they have been applied; and it outlines how innovation labs can be run. Finally it covers how to fund innovation and it suggests how humanitarian innovation might develop in the future.

'The authors have done a really excellent job in drawing together leading experts across a broad range of innovations that are already being implemented in the "for profit" world and demonstrating how these could be successfully employed to improve the effectiveness and efficiency of humanitarian preparation and response activities.'

Peter Tatham, Professor of Humanitarian Logistics, Griffith Business School, Griffith University, Australia

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Eric James is co-Founder of Field Ready, an NGO focused on innovating for improved ways of providing relief. He has nearly two decades working in humanitarian relief.

Abigail Taylor is a strategic advisor for the consulting firm Spark Strategy. She has developed considerable experience in bussiness development and partnership management.

[Sample Chapter]

Chapter 24: Field Ready transforming aid worldwide

Tessa Fixsen-Lavdiotis

Abstract: Field Ready, a humanitarian organisation dedicated to transforming logistics through technology, innovative design and engaging people in new ways, has developed a practical approach to innovation. This incorporates a systematic means to reach scalability.

Key Words: Innovation process, scaling, design, livelihoods, health, search and rescue

An organisational approach to innovation

Field Ready is pioneering an approach that addresses the burden of slow, expensive and cumbersome humanitarian supply chains. Field Ready has developed an organisational approach that bypasses these supply chain issues by innovating ways to make supplies and train others to do so. The result is the development of unique products and services that are faster, less expensive and, ultimately, better than existing logistical supply chains.

Our focus in on people and their problems where they experience them. For Field Ready, technology is simply a means to an end; tools that help achieve clear goals. We use exponential technology as well as appropriate technology to carry out local manufacturing in ways that have never done before in the field. A focus on human-centred problem solving is more important than simply application of technology. By working closely with others – through meaningful partnerships, operating within existing systems and frameworks, and sharing our knowledge widely – Field Ready is a 'trim tab' in areas that will transform the way aid is done worldwide.

Field Ready has developed a five-step, non-linear process that enables to us work across sectors (whether DRR, search and rescue, health, WASH, livelihoods, education or food security). In following this process, we engage in a number of practices which helps us arrive at novel solutions to very difficult problems. This includes having a bias toward action, not dividing between 'creative' and 'non-creative' team members, and iterating by making lots of prototypes (which means allowing for failure but also small successes that lead to bigger results). This process also helps us understand and work within the Four C's (see Chapter 4). This process includes:

1. **Assess**

To understand the context and those we work with, an assessment is undertaken. This uses mixed methods such as rapid participatory interaction, HCD and lean methods. In the process, Field Ready develops a deep understanding and empathy that allows us to work toward practical and sustainable solutions with other aid workers and affected people.

2. Design

Using an iterative process, Field Ready takes into consideration smart design, technology and how people can benefit from its proper use. The organisation works closely with end users where they live and work to ensure viable impact.

3. Make

Field Ready uses experienced people and the right technology when working with local makers and manufacturers so that genuine needs can be met regardless of the sector or challenge faced. We possess the capacity to meet unique needs and then take that to scale.

4. Share

Timely distribution is the essential element of an effective supply chain and this represents one of our key advantages of local manufacturing. We not only share the items we repair, make unique parts and mass produce but also the knowledge that has been used through hard earned experience. We do this through training and other capacity building measures on all steps of this process.

5. Lead

By pioneering our approach, we have been able to set the example for others to follow. Contributing to improving our sector is a key indicator of our success. This is done with humility and with partnership in mind. We also bring groups together through digital platforms.

This approach is enabling us to scale with different products, described below, and services such as training and technical advice. The following three case studies show a range of ways we manage innovation. Each has an explicit goal, a clearly formed problem statement, employs a tangible technology and has a definitive result.

Case Study #1: Radio Antenna in Nepal

Goal: To make better, more reliable antennas and increase radio coverage. A group of amateur radio enthusiasts played an important role in the aftermath of the 2015 Nepal earthquake, using their home radio stations to relay messages to the army and police. However, the earthquake meant that many ground stations in their network had been destroyed, and unfortunately there were still some earthquake affected areas they could not communicate with.

In preparation for future disasters, this group was seeking to increase radio coverage of Nepal by installing antennas that do not rely on station-to-station communication, but instead communicate via satellite. However, they were having trouble getting their radio antennas to work.

***Problem Framing*:** There were many small problems accumulating that inhibited the performance of the antenna, such as the type of antenna, impedance matching, quality of the soldering, and assembly accuracy. We compared importance versus difficulty, searching for the one that would yield the most impact on performance for the least time and effort. We chose to focus on assembly accuracy. Regarding radio transmission, the higher the frequency of the radio waves being transmitted, the smaller the antenna must be. The frequency for communicating via satellite is much higher than that used for ground station to ground station communication, hence the antenna that the team was working with was much smaller than they were used to. It is possible to easily build a large antenna by hand because errors in dimensions and inexact placement of parts does not matter much. However, small inaccuracies can lead to large differences in performance.

Antenna accuracy was good to focus on because it was likely to have a positive impact on antenna performance, and a prototype could be developed and tested within a couple of days. Focusing on type of antenna, impedance matching and soldering may have had just as much impact on performance, but were not as straightforward to test or solve.

Technology**:** Field Ready worked with the team to design some simple 3D printed parts to quickly and accurately assemble the antenna, by snapping the components together into pre-defined locations. The 3D printed plastic chassis holds the metal rods of the antenna at precisely the correct locations, ensuring proper assembly accuracy from unit to unit.

Results**:** The work resulted in a significantly improved antenna, and a design that could easily and accurately be replicated. The antenna design was used in other contexts with similar results.

Case Study #2: Umbilical Cord Clamps in Haiti

Goal: To design and 3D print sterile umbilical cord clamps and other medical items for babies, mothers, and medical personnel.

Problem Framing**:** Small clinics in rural Haiti often have no access to sterile medical supplies. Many of these supplies are unavailable, while others are too expensive for many of these clinics to afford. One example is the clamp used to close the umbilical cord during delivery. The lack of sterile clamps poses a health risk to mothers and babies. Neonatal sepsis, a type of infection that can originate at the umbilical cord, is one of the leading causes of death among infants in the region.

The Field Ready team interviewed personnel at a number of clinics, which led to the identification of various immediate needs. One clinic, for example, needed birthing kits to give out to pregnant mothers because, often times, women who go into labour may be five or ten miles from the clinic with no means of transportation. After assessing multiple clinics and learning more about the delivery process in Haiti and the needs of these rural clinics, it became clear that expanding access to sterile items like clamps would significantly improve the health of mothers, babies, and medical personnel. The Field Ready team set out to design an umbilical cord clamp that would fulfil the following requirements: The clamp must be sanitary and should not be reusable. Therefore it was designed to break after the first use. It needed to be intuitive and easy to grip. It needed to be easy and cheap to produce. This meant coming up with a design that minimised amount of material and must remain on the baby for three to five days. Preferably it would be made from a non-porous, medical grade material to minimise the risk of bacteria and infection.

[Sample Chapter]

Technology: Field Ready made different designs using 3D printed clamps.

Results: Batches of umbilical cord clamps were manufactured and distributed at several sites in Haiti working with a local partner. This product has since been added to an array of useful items that are capable of being made in a kit for local production.

Case Study #3: Rescue Airbag in Syria

Goal: To invent a device for rescuing trapped people in destroyed buildings, which can be produced in the field.

Problem Framing: The Syrian civil war has claimed many lives and caused untold human suffering. Urban warfare means that people inhabiting multi-story buildings are at risk of becoming entombed in structures that have been directly hit by artillery, aerial strikes and 'barrel bombs'. People trapped by rubble and collapsed buildings can survive the attack but frequently don't because they cannot be rescued in time.

The extremes of the war make rescuing trapped civilians a nearly impossible task. To lift heavy debris, such as concrete slabs weighing several tons, special equipment is needed. While lifting airbags are available to well-supplied search and rescue teams worldwide, these can prohibitively expensive.

Working with a number of excellent partners, Field Ready identified the specific parameters needed – small, portable, easy-to-use, robust and inexpensive - using sketching, photography and prioritisation tools. We followed the widely used 'British Standard' for rescue airbags to develop a workable solution that can be implemented within the limitations of cost and the combat zone.

Technology: The Field Ready team set out to design a reliable lifting air bag that could be produced from readily available, inexpensive materials. Using an iterative design process, a number of air bag prototypes were created and tested. The initial model involved using a reinforced vehicle tire inner tube. The second and third prototypes refined this idea, but were still not ideal, so the team prototyped alternative models using thick rubber flooring mats. Along the way, the team created a testing rig capable of applying thousands of pounds of pressure with supplies and compressed air procured locally.

Results: The final prototype was positively received by search and rescuers in northern Syria. With a final go-ahead, an initial batch of 100 rescue airbags was manufactured and distributed wherever these tools were needed. In March 2017, it was first used to rescue two people successfully following an aerial bombardment. Following this experience, locally made rescue technology can be used worldwide to directly save people's lives.

About the Author

Tessa Fixsen-Lavdiotis is a Program Officer for Field Ready. Tessa holds an MS in Refugee and Forced Migration from DePaul University.