

Chapter 3

3D Printing Meets Humanitarian Design Research: Creative Technologies in Remote Regions

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ABSTRACT

This chapter provides an introduction to the discourse informing humanitarian design research practice and a context for evaluating problem solving strategies in this area of research. Advances in the development of creative technologies, and in particular 3D printing, are stimulating innovations in approach and practice. This chapter is based on a design research project that uses advances in digital technologies to address the logistical challenges facing Oxfam's Water, Sanitation and Hygiene (WASH) projects in East Africa, whilst simultaneously responding to current design theory in humanitarian design research. It takes into account people, process and technology in developing a response to the opportunities provided by creative technologies that offers a new approach to achieving an appropriate balance between paternalistic and participatory design research in this discipline. The field study informing the research took place in Nairobi in 2014/2015 and was principally supported by the Humanitarian Innovation Fund.

INTRODUCTION

This chapter introduces the discourse on approaches used by designers working in humanitarian research and the background to the current opportunities provided by recent advances in digital technologies. It then outlines an example of practice that suggests new research directions and an alternative approach to practice for humanitarian design research enabled by creative technologies. Industrial designers have long been involved in design research to support the work of international aid agencies but, to date, the area of humanitarian logistics has been largely outside the scope of the discipline. However, recent innovations in digital technologies have inspired design researchers to look at new opportunities and

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to collaborate with colleagues from the humanitarian logistics field to address the inherent challenges within current supply chain systems. This chapter describes a pilot project funded by the Humanitarian Innovation Fund¹ and aims to illustrate how humanitarian design research in the field of logistics is being impacted by advances in creative technologies and new thinking, whilst highlighting the tensions. The project was hosted by Oxfam G.B. and brought together researchers in humanitarian logistics and industrial design to investigate how 3D printing could circumvent issues in the current supply chain for Water, Sanitation and Hygiene (WASH) projects in East Africa (Oxfam, 2015).

BACKGROUND

Discussion on the merits of Western educated design researchers creating products for humanitarian aid has long been a controversial subject. This is because there has been a tension between the idea of working with what might be perceived as a paternalistic approach, and, at the other extreme, an arguably invasive participatory, co-design approach - and it has proven very hard to get the balance right. Over forty years ago, design activist Victor Papanek (1971) challenged the capitalist focus of commercial, Western-educated designers by calling for the design of technologically appropriate solutions to solve problems in developing countries. Pilloton (2009) describes appropriate technologies as a “field of engineering that designs, builds and implements basic technological systems that are suitable for a particular location and the skills, materials and needs of a demographic” (p. 35). Over the last forty years, there has been a significant growth in humanitarian design research practice, and yet the field remains a difficult one for designers to navigate, particularly in relation to the use of appropriate technologies. This is evidenced by the lack of consensus on the merits of outcomes produced through humanitarian design research, as discussed by Stohr and Sinclair (2012), and also Nussbaum (2010), with examples of design activists being acclaimed by Western societies yet apparently unappreciated by those communities they are trying to help. An example is the Aquaduct bicycle concept by leading design consultancy, IDEO (IDEO, 2008). This won the ‘Innovate or Die!’ contest in 2008. IDEO presented it as a way to collect and filter water in developing countries using pedal power. The bike is actually a tricycle that houses a water tank on the back, with a filtration system that uses a pedal driven peristaltic pump to draw water from the tank into a clean container on the handlebars. At the time of its design, the intention of IDEO, according to the company website (2008), was for the team to evolve the concept into *an economically – and technologically – viable solution, looking to address challenges such as cost, suitable purification technologies, and the logistics of addressing an issue that affects billions of people around the world* (Flahiff, 2008). However, the Aquaduct bicycle remained a prototype. In the publication, *Design Like You Give a Damn*, Stohr and Sinclair (2012) argued that the measure of success for a design for humanitarian needs should be measured through consideration of the uptake of the product, its longevity, impacts and any side effects. According to Pilloton (2009), “Without contextual understanding and user feedback, a design for social impact will likely fall short of its intentions - however good they are” (p. 19). For this contextual understanding and user feedback to be realistically achieved, she argues that the target community for the humanitarian design need has to be central to, and engaged in, the design process. This recognition that user centred design needs to be informed by a more ethnographic approach to research has led to a rise in participatory design practice in both domestic and international contexts. However, in relation to theory supporting humanitarian design research, the initial enthusiasm for designers and students to spend time with the international community they are designing for has waned. In conjunction with

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