

Cut the crap; design brief to pre-production in eight weeks: Rapid development of an urban emergency low-tech toilet for Oxfam



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With the world becoming increasingly urbanised, emergency sanitation for these environments have been found limited and insufficient. Governments and NGOs are becoming aware that changes need to be made and innovative solutions developed fast. Oxfam GB in collaboration with C4D of Cranfield University undertook a design brief to develop a low-tech sanitation solution for urban emergencies to be completed within a limited time frame. A multidisciplinary team of designers and engineers developed a rapid, low cost, design-led innovation framework, which captured stakeholder knowledge to create a solution that addressed the problem and was feasible for production. This article reveals the journey from design brief to pre-production in eight weeks culminating in the successful creation of a new product.

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In 2011 around 244 million people were affected by natural disasters across the world (Guha-Sapir, Vos, Below, & Ponserre, 2012). Regardless of wealth any country can be impacted, and the need for emergency sanitation solutions are paramount, especially in relation to the recent global issues surrounding Ebola, highlighting an unmet need for waste management systems for quarantined communities to prevent contamination of ground water and stop the spread of disease. With the majority of the population now dwelling in urban areas across the world (WHO, 2014) existing systems deployed by governments and NGOs have been found wanting. The implementation of rural sanitation solutions has been an adequate stopgap but the application to urban settings are less than ideal situation, and improvements need to be made to deal with any future events (Patel, Brooks, & Bastable, 2011). Urban emergency environments can be particularly problematic due to the variety of factors that can have an impact such as lack of access, land ownership and high population density. Emergency sanitation is a field not often given the same level of consideration as other types of relief response. The emergency Water, Sanitation and Hygiene Promotion

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programme (WASH) led a gap analysis project, funded by The Humanitarian Innovation Fund (HIF), commissioned to identify which areas needed the most attention. It was found that many issues surrounding sanitation are not being addressed (Bastable & Russell, 2013) which is astonishing, as a system's approach would demonstrate that inadequate management of human waste could be the cause of many issues surrounding contaminated ground water. Oxfam GB in partnership with International Federation of Red Cross (IFRC) and WASTE (advisors on urban environment and development) initiated "The Emergency Sanitation Project" to propose new concepts to develop modular technologies for sanitation solutions in humanitarian settings (Emergency sanitation project, 2013). This scheme was the driving force behind the conception of the project outlined in the article; it informed the scope and laid out the expected outcomes to be met.

The aim was to develop and build a prototype of a novel, low technology, portable sanitation solution, which could be deployed to provide an immediate sanitation response for urban emergency situations. This was to be achieved through these following objectives: explore existing systems that could be applied to the problem, perform the necessary design and build of a concept prototype to demonstrate functionality of the newly created solution, and consider the implementation and adoption strategy as well as the lifecycle and legacy of the product. After initial contact with the client, it was recognised early on that to accomplish these objectives in just eight weeks and competently address the problem without requiring the team to be experts in the field of sanitation, a design-driven framework would need to be conceived and executed by the team that was structured, flexible and ensured all the requirements were captured and deadlines met. This would enable the team effectively and efficiently to use the knowledge of the group and the stakeholders of the project. The resulting framework facilitated the successful development of the product, and demonstrated the versatile nature of the rapid product development process which could also be applied to other New Product Development (NPD) situations, and ultimately assist other design teams to systematically innovate faster and keep up with the challenges of fast evolving technologies and market requirements.

This paper is divided into the following three sections:

1. A literature review to appropriately assess which methodologies could be used for the design process.
2. The case study of the urban emergency sanitation project, outlining the process.
3. Discussion and conclusions evaluating and reflecting on the performance of the proposed framework.

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